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**Select & Start  
Your Own  
Industry**

(4th Revised Edition)



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# Select & Start Your Own Industry

(4th Revised Edition)

*by*  
*NPCS Board*  
*of*  
*Consultants & Engineers*



Publication Division

**NIIR PROJECT CONSULTANCY SERVICES**

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## Select & Start Your Own Industry

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## Chapter 1

## PROJECT IDENTIFICATION AND SELECTION

Entrepreneurship is one of the critical decisions to be made. It involves number of risk and has its own advantages also. If you are thinking about starting a business of your own, you would need to take your time and not rush things. Though it is very exciting to start your very own business, you should take it slowly since you need to consider a lot of important aspects that could affect your business. There are several factors that, if taken for granted or overlooked, could spell the difference between success and failure. Taking your time in setting up all the things you need is very important especially if it would be your first time.

First of all, you need to think about the type of business that you are going to set up. It is good if you are already decided on what business you would put up but if not you need to choose one that you are comfortable with. A simple business plan would be a great help when you are starting out. If you do not know how to make one, you can hire the services of marketing experts or firms to design one for you. If you do not have a big budget, you can make use of templates.

Next thing you have to consider is manpower. Determine how much manpower you would need. Even a simple online business needs manpower and it would be ideal to have the different aspects of your business looked after by different persons. Though you may have the knowledge on how to run your entire operation, it would be more efficient if you don't do everything on your own. Along with manpower is their salary. You also need to consider how many people you can afford to work for you. Make necessary adjustments depending on your budget.

Another important factor to consider is the materials you would need for your business. If you will be running an online business, the equivalent of physical materials would be a main website, its content, graphics, etc. When purchasing your materials or have someone create your website, it would be best to compare different sellers or service providers first. This is for you to get the most out of your budget. You need to save as much money as you can since you are just starting out.

The last thing you need to think about would be your product or service that you would sell. Make sure that your product or service is of high quality. Put yourself in the shoes of your customers and ask yourself if you will buy that product or employ that type of service that you are selling. It is always a great idea to see things at a customer's viewpoint. This would help you identify what your customers really want and determine how to keep them happy or satisfied. The ultimate goal of any business is to give their customers what they want. Ensure that you understand all these important things that you have to consider and start taking actions.

### **Business Opportunity**

Business Opportunity may be defined as a business proposal an entrepreneur would like to pursue considering risk and the reward involved in the proposal which may be manufacturing or servicing or trading.

This approach calls for a scientific way of classifying Business Opportunity based on its origin, application, user or source. Based on this, it has been categorized under the following broad nine categories. They are:

- ★ Resource based
- ★ Demand based
- ★ Skill based
- ★ Ancillary/ vendor
- ★ Inputs to primary sector
- ★ Inputs to secondary sector
- ★ Inputs to tertiary sector
- ★ Waste based
- ★ Innovative

### **Principles of Investment**

- ◆ Invest in projects that yield a return greater than the minimum acceptable hurdle rate.
  - ★ The hurdle rate should be higher for riskier projects and reflect the financing mix used - owners' funds (equity) or borrowed money (debt).
  - ★ Returns on projects should be measured based on cash flows generated and the timing of these cash flows; they should also consider both positive and negative side effects of these projects.



- ◆ Choose a financing mix that minimizes the hurdle rate and matches the assets being financed.
- ◆ If there are not enough investments that earn the hurdle rate, return the cash to stockholders.
- ◆ The form of returns - dividends and stock buybacks - will depend upon the stockholders' characteristics.

### **What is Investment or a Project**

- ◆ Any decision that requires the use of resources (financial or otherwise) is a project.
- ◆ Broad strategic decisions
  - ★ Entering new areas of business
  - ★ Entering new markets
  - ★ Acquiring other companies
- ◆ Tactical decisions
- ◆ Management decisions
  - ★ The product mix to carry
  - ★ The level of inventory and credit terms
- ◆ Decisions on delivering a needed service
  - ★ Lease or buy a distribution system
  - ★ Creating and delivering a management information system

### **Sources of Project Ideas**

A variety of sources have to be tapped to stimulate the generation of project ideas.

#### **(a) Analysis of industries' performance:**

An analysis of the capacity utilization and profitability including break-even analysis of existing industries will indicate, promising project opportunities which are relatively risk free and profitable. Capacity utilization analysis of existing industries will provide information about the potential for further investment. Such an analysis, region wise for products with high freight costs will be more useful.

#### **(b) Analysis of inputs and outputs of industries—**

A careful analysis of inputs required for various industries may suggest potential project opportunities, some firms produce internally some components at a high cost. Perhaps these can be produced and supplied at a lower cost

enjoying economies of scale. An analysis of the outputs may indicate opportunities for further processing of output or processing of wastes/by – products.

**(c) Analysis of imports and exports—**

An analysis of import statistics of past five years helps in understanding the trend of imports of various materials and the potential for import substitution.

(i) Replacing imports with indigenously manufactured materials is beneficial because it improves the balance of payment situation, (ii) It creates employment opportunities and (iii) It provides market for supporting industries and service.

Similarly, analysis of export statistics is useful in knowing the export possibilities of various products.

(d) Government's guideline to industries, published annually is available as a source of information to potential entrepreneurs / investors. The guidelines provide information on existing capacities for various items, estimated demand, scope for exports, etc.

**(e) Suggestions of financial institutions and developmental agencies—**

State Financial Corporations, State Industrial Development Corporations, and other Development Agencies periodically conduct studies and feasibility reports with a view to promote development of industries in their respective states.

**(f) Survey of local resources—**

A survey or investigation of local resources may indicate opportunities for adding value to locally available materials. National Council of Applied Economic Research conducts surveys of various regions in the country throwing light on those regions which have the potential for industrial development.

**(g) Analysis of economic and social trends—**

An analytical study of economic and social trends may indicate changes in economic trends which provide new business opportunities demand for products which save time-instant food items, micro-ovens, electric cookers, etc., is increasing. Likewise, the demand for entertainment products is also increasing.

**(h) New technologies—**

The network of scientific and research laboratories functioning under the Council of Scientific and Industrial Research have developed several new processes and technologies. These offer opportunities for commercial exploitation.

**(i) Emulating consumption patterns from abroad—**

There are opportunities for setting up projects in areas that are new in our country, but are quite common in many developed countries. The entrepreneurs prepared to take higher risk can look into similar project opportunities.

**(j) Restoring life to sick units—**

There are thousands of units which are regarded as sick. It is possible to restore life to many such units through better management, infusion of further capital, and provision of complementary inputs. Sick units, therefore, provide good investment opportunities. These investments have the additional advantage of short gestation periods and marginal efforts to restore life to the sick undertakings which are on the anvil of closure.

**(k) Analysis of unsatisfied needs of consumers—**

For a wide range of existing products of daily consumption, it may be worthwhile to analyse whether these products are satisfying the psychological needs of consumers. Such an analysis may reveal opportunities for investment.

### **Important Factors to Identify a Project**

Following factors are important to consider starting a new business. Compromising any of these factors could hamper the growth. Starting a business these days is very challenging and an all round knowledge of various factors is required to run a successful one.

◆ **Knowledge/Expertise**

Any business requires some amount of basic knowledge and experience. The owner needs to be aware about the business he intends to start. Knowledge and expertise about the product or service are keys to a successful business. In case of limited knowledge the owner may not be able to sustain the business and can be fooled by the vendors, suppliers and competitors.

Expert knowledge is especially required if the field of business is a niche field. For instance the construction or software industry would require more knowledge as against a retail business selling a particular brand of clothes or shoes.

◆ **Research**

Researching in and around your industry is mandatory. Once a decision is taken on the business you intend to start, the next step is to explore the demand/market for the product / service. Certain products will only have a domestic market for them whereas others can be successful on an international level. The concept of research is misunderstood by many. While researching people focus on various strategies to be used losing

sight of their competitors. Though the idea of a business is to sell products there is no reason to underestimate your competitors. Know the strategies being employed by your competitors and then create a strategy to beat them. Researching the market in this manner will save time and energy.

If the product/service is expected to be sold locally, the demand for it needs to be assessed. In case an international market is expected then rules and regulations for dealing internationally need to be found out.

### **Market Research**

It can be defined as the process of gathering, analyzing and interpreting information about a market, about a product or service to be offered for sale in that market, and about the past, present and potential customers for the product or service; research into the characteristics, spending habits, location and needs of your business's target market, the industry as a whole, and the particular competitors you face.

### **Reaching Consumers**

Marketing is dynamic in nature and has gone through many faces in the past decade. A marketing strategy should be well prepared and executed before launching your business. You need to have sound knowledge in marketing to come up with an idea that will reach your hungry crowd. To be short and precise, businesses should reach consumers. Of course I do not advice knocking on every consumer's door. But creating a portal that could provide ease in reaching your customers would be of value.

### **Sought After Product/Service**

Make sure that the product or service you are trying to sell is much sought after. Though there are buyers for everything, unless a product/service is in demand you will eventually lose. Make sure that the demand increases or create a demand for your product/service. Demand for a product/service can be created if it caters and satisfies people on a larger scale.

#### **◆ Total Project Costs**

It is important to correctly assess the total project cost required to set up and run the business successfully.

In a capital intensive business such as starting a manufacturing plant, the start up costs can be very high. You need to identify the total amount which will be spent on the land & building, plant & machinery, furniture and office equipment, vehicles etc. If a business is in the nature of retail you will need to identify the cost of the store and furniture. Amount required for the decoration of the store needs to be assessed. Similarly in case of an office the major cost will be for the furniture and office

equipment. An office or firm can be started at a relatively lower cost initially with only the basic requirements.

One also needs to take care of the working capital requirement. This will mainly consist of the inventory which needs to be maintained and the credit which is extended to the customers. From this the supplier's credit is deducted to arrive at the Working Capital Requirement. The Working Capital Requirement can be quite high for certain industries for example inventory will need to be maintained in a garment store. Similarly in case of a grocery shop there is need for huge inventory for which credit may not be given initially by the suppliers.

◆ **Financing/Capital**

After identifying the initial costs required for starting the business, the financing pattern will need to be decided. The financing pattern will be mainly by way of capital introduction by the owner and borrowed funds.

Depending on how much capital the owner can introduce the balance amount will need to be borrowed. Funds borrowed will be either short term loans or long term loans. The terms and conditions for borrowing funds will need to be studied such as the cost of borrowing, security required, rate of interest and the repayment terms. The owner will need to approach a number of banks to get information about their terms of lending and draw a comparative analysis to identify which funding is the most beneficial for him.

As a thumb rule short term funds should not be utilized for the purchase of fixed assets. Short term funds are mainly used to meet the working capital requirement. The logic is that if short term funds are used to purchase fixed assets how are you going to repay the short term loan if the business has not progressed.

Once the financing pattern is identified the owner will need to decide how the money is going to be utilized. The financial plans of an enterprise should be formulated by taking into consideration the following factors:-

The financial objectives of the company

- ★ Nature and size of the business
- ★ The image and credit-worthiness of the enterprise
- ★ Growth and expansion plans
- ★ Capital market trends
- ★ Government regulations

◆ **Competition**

Before entering new business, information about market competition needs to be found out. In case a product is a monopoly then the competition

will not matter. Otherwise the success of the business will depend upon the demand and supply gap. Thus if there is a huge demand then you can enter the business in spite of the market competition. Otherwise you will need to be stronger than the competitors to gain an entry. Normally existing firms will always have an advantage due to the experience they have and because they may be well equipped.

Information such as who are the competitors, what is their market strategy and what factors are required to compete with them are important.

◆ **Location**

Deciding an optimum location for the business is a strategic and an important one. A good location goes a long way in making the business successful. The location needs to be carefully chosen.

Some places have advantages over the others. You can save out on taxes, water and electricity costs if you are located in some areas. The raw materials can be easily sourced, the manpower would be easily available and you can save out on transportation costs in case of certain locations. Setting up a business in certain location could lead to subsidy and rebates from the Government.

In the case of a retail business one needs to be located in a well populated area and one which is easily accessible.

Certain niche products / services of different competitors are available at a single location. For example there are software belts having all software companies. Similarly there are gold marts which have different gold vendors and jewellers at a single location.

◆ **Regulatory Requirements**

Once an entrepreneur has taken all the important decisions relating to starting a business, he/she has to take into account the basic regulatory requirements which are to be followed for setting up the organisation. The most important regulation is the Companies Act, 1956, which regulates all the affairs of a company. It contains provisions relating to the formation of a company, powers and responsibilities of the directors and managers, raising capital, holding company meetings, maintenance and audit of company accounts, powers of inspection and investigation of company affairs, reconstruction and amalgamation of a company and even winding up of a company. The Ministry of Corporate Affairs, earlier known as Department of Corporate Affairs under Ministry of Finance, is primarily concerned with administration of this Act as well as other allied Acts and rules & regulations framed there-under.

The next important regulation relates to environment. The environmental regulatory requirements envisage a wide legislative framework covering every aspect of environment protection like air, water, noise, forest

conservation, wildlife protection, etc. Also, separate set of laws and rules for emission of hazardous wastes have been enacted. The Ministry of Environment and Forests (MoEF), is the nodal agency for regulating all such environmental aspects. It undertakes conservation & survey of flora, fauna, forests and wildlife; prevention & control of pollution; afforestation & regeneration of degraded areas. Every industry has to abide by all such guidelines and parameters for environmental protection because only this will ensure its sustainable progress and growth.

◆ **Return on Investment**

Return on Investment (ROI) is calculated as Net Profit divided by the Investment made. The ROI is low in the initial years and is expected to grow on a year on year basis.

The ROI needs to be compared with the return that would be earned from alternative business options available. For instance it could be compared with any other source of income, such as money earned from investment in the stock market. Similarly the Return on Capital must be greater than the rate of interest earned from a fixed deposit kept with a bank.

◆ **Hiring Human Resource**

Human Resource is also an important determinant of business location and functioning. Factors such as the availability of labour of different skill levels, productivity and cost of labour, flexibility of labour, attitude and behaviour patterns of labour, nature of trade unionism etc. are important to a business. The whole process begins with the task of hiring manpower for starting a business for filling the present and prospective vacancies in the company. The objective of hiring manpower is to procure the right number of employees, with the required qualifications to do the right type of jobs. The hiring process involves four main steps i.e. manpower planning, recruitment, selection and placement. Each of these steps and sub-steps help the employer obtain more and more information about the candidates and thus help in obtaining the best possible manpower for the firm. This function must be performed carefully because any error committed at the time of hiring manpower may prove to be very costly for the firm both in the short as well as long term. These costs will be in the form of waste of time, money and energy in repeated hiring process. The training costs incurred on them will go waste. The efficiency of the organisation will go down due to hiring of unsuitable candidates. At the same time the rate of absenteeism and labour turnover will be higher.

◆ **Technology**

It is always better to invest in the best technology at the time of start up itself. Post investment, monitoring of the technology purchased is required. Technology would include plant & machinery as well as latest



office equipment. One should not exclude the software required to monitor the business. Choosing optimum software is a challenging task. A technologically advanced business is expected to perform much better in the longer run.

◆ **Business Plan**

A business plan is a comprehensive, written description of the business of an enterprise. It is a detailed report on a company's products or services, production techniques, markets and clients, marketing strategy, human resources, organization, requirements in respect of infrastructure and supplies, financing requirements, and sources and uses of funds. The business plan describes the past and present status of a business, but its main purpose is to present the future of an enterprise. It is normally updated annually and looks ahead for a period of usually three to five years, depending on the type of business and the kind of entity.

Every new venture should have a business plan. A business plan is the formal written expression of the entrepreneurial vision, describing the strategy and operations of the proposed venture. The business plan also goes by other names, depending on its intended audience. Presented to a banker, it may be called a "loan proposal." A venture capital group might call it the "venture plan" or "investment prospectus."

The advantages of writing a business plan far outweigh the costs. The purpose of the plan is to enable the top executives of the firm to think about their business in a comprehensive way, to communicate their objectives to individuals who may have a stake in the firm's future, to have a basis for making decisions, and to facilitate the planning process.

Entrepreneurs should undertake the task of preparing the business plan personally. Although outsiders - consultants, accountants, and lawyers - should be tapped for their advice and expertise, the promoter or the initial top management team should be responsible for the writing. Personally drafting the plan will enable the entrepreneurs to think through all aspects of the proposed business and ensure that they are familiar with all the details, for they will have to make decisions about the new venture and be responsible for those decisions. Moreover, investors expect the founders to be involved in and knowledgeable about the proposed enterprise.

The business plan can personally benefit the entrepreneurial team. Founding a new business can be enormously fulfilling and exhilarating, but it is also an anxiety-ridden and tense experience. Usually a great deal of money is at stake, and the consequences of poor decisions can affect many people for a long time. In developing and writing a business plan, the entrepreneurial team reduces these anxieties and tensions by confronting them in advance. By projecting the risks of the new venture



into the future, the team comes to grips with potential negative outcomes and the possibility of failure. The knowledge that comes from this experience can reduce the fear of being taken by surprise by problems that could have been foreseen and provided for at the very outset.

Every Business Plan must have:

- ★ Cover Page
- ★ Table of Contents
- ★ Executive Summary
- ★ Development and Production
- ★ Resource Requirement
- ★ Format and Presentation
- ★ Writing and Editing
- ★ Summary

#### **Importance of Project Identification**

- ★ It has long term consequences (make or break)
- ★ Involves commitment which cannot be easily reversed
- ★ Ideas are put into action
- ★ Projects are catalytic agents for economic development
- ★ Involves creative use of resources- manpower, capital, raw materials etc.
- ★ Generates value addition and build-up national capital
- ★ Brings socio-cultural development
- ★ Leads to development of infra-structure and environment

## Chapter 2

## HOW TO INITIATE THE PROJECT IDENTIFICATION PROCESS WITH THE HELP OF THIS BOOK

Selecting project for a business is a critical process and hence before choosing a project, consider your interests, background, what is necessary to start the project and the resources available to help you complete it. This book will help you choose the right project. First scrutinize the contents of the book and identify your interest area in which you want to venture. Study the respective chapters and make your decision.

All the projects briefed in the book are available at **Niir Project Consultancy Services** in the form of Techno-Economic Feasibility Reports/Detailed Project Reports which can be availed on demand. After making the choice you can send your inquiry by mail or can proceed by contacting **Niir Project Consultancy Services** directly and you will be assisted according to your requirement. We also provide assistance during the implementation the project.

### Activated Carbon from Coconut Shell

Activated carbon is very important chemical has wide application and employed by numerous industries which require absorption of certain gases and vapours in purification, in catalytic chemical reactions, de colorization of vegetable oil and sugar solutions. Activated carbon manufactured from coconut shell is considered superior to those obtained from other sources mainly because of small macro pores structure which renders it more effective for the Coconut shell is used for manufacturing a variety of products of commercial importance including activated carbon. Activated carbon is a non graphite form of carbon which could be produced from any carbonaceous material such as coal, lignite, wood, paddy husk, coir pith, coconut shell, etc. adsorption of gas/ vapour and for the removal of colour and odour of compounds. The activated carbon is extensively used in the refining and bleaching of vegetable oils and chemical solutions, water purification, recovery of solvents and other vapours, recovery of gold, in gas masks for protection against toxic gases, in filters for providing adequate protection against war gases/nuclear fall outs, etc.

### Applications

- ★ Granulated activated carbons are used for purification of gases or liquids and are used in a vertical carbon packed column
- ★ Activated carbons have been used as carriers for catalyst in the manufacture of chlorinated hydrocarbons.
- ★ Activated carbon finds application in the preparation of pills and digestive tablets. Its adsorptive properties are utilized in the treatment of ailments of the stomach due to hyper acidity.
- ★ In the laboratory, it is used for the production of high vacuum, purification of gases, determination of vapor content in a carrier gas, etc.

### National Scenario

In India activated carbon industry is of recent origin. There were only one or two manufacturing units in early fifties which have now increased to 50

or even more. But now activated carbon industry is widely spreaded in different parts of the country. Most of the units are in small scale sector. However, based upon the enquiries there are more than 50 units manufacturing activated carbon for selling. They are located in different parts of the country. Most of these units have capacity of more than 100 tons. Quite a few units have installed capacity of more than 1,000 tons also. Only 10-12 units cater to the national market, all other units cater by and large to local or regional market. It is learnt that the total installed capacity of present available was about 75,000 tons and production was around 65,000 to 70,000 tons which includes purified and regenerated carbon too.

### International Scenario

Estimated demand of activated carbon in developing countries like Bangladesh, Sri Lanka and gulf countries, where industrial development is emerging up is around 134580 MT in 2014-2015. The future of beverage industry is very bright. As the demand for activated carbon from this industry is likely to increase rapidly the estimated to be 15 percent annum. Activated carbon is also being used in nuclear plants and laboratories for containment of many radioisotopes.

Since the applications and demand of activated carbon is immense therefore the potential of the product is excellent. It is one of the imperative fields to endeavor.

#### *Cost Estimation:*

Capacity	:	3 tonnes/day
Plant and Machinery	:	45 Lakhs
Total capital investment	:	200 Lakhs
Rate of return	:	43%
Break Even Point	:	45%

### Activated Carbon from Coconut Shell by Continuous Rotary Kiln

Coconut shell is used for manufacturing a variety of products of commercial importance including activated carbon. Shell is carbonized by using methods like pit method, drum method, destructive distillation etc. Shell based activated carbon is extensively use in the process of refining and bleaching of vegetable oils and chemical solutions, water purification, recovery of solvents, recovery of gold etc. It is used in gas masks and a wide range of filters for war gases and nuclear fall outs. Coconut shell based activated carbon units adopt steam activation process to produce good quality activated carbon. Activated carbon is produced from organic based materials such as coconut shells, palm kernel shells, wood chips, sawdust, corn cobs, seeds etc. The major importers of activated carbon for the period were the gold mining companies, the brewery and the soft drink industries. Activated carbon is used in the gold

mining industries to recover gold from cyanide solution using the carbon in pulp or carbon in leach processes. In the brewery and soft drink industries, activated carbon is used mainly to purify the water used in production. In India activated carbon industry is of recent origin. There were only one or two manufacturing units in early fifties which have now increased to 50 or even more. Activated carbon industry is wide spreaded in different parts in the country.

The future of beverage industry is very bright. History of activated carbon clearly indicates that it is one of the adsorbent materials both in liquid and gas phases and its applications have steeply increased with growth of modern process industries.

A new entrepreneur venturing into this project will find it very lucrative.

***Cost Estimation:***

Capacity	: 3000 MT/Annum
Plant & Machinery	: 395 Lakhs
Cost of Project	: 767 Lakhs
Rate of Return	: 43%
Break Even Point	: 52%

**Activated Carbon from Bamboo**

Activated carbon is a non graphite form of carbon and is micro crystalline in nature. It is extensively used in various industries as a very good adsorbent for odour or colour. There are two varieties of activated carbon viz gas phase or the liquid phase adsorbents. The liquid phase activated carbon is usually powder or granular form where as the gas phase adsorbent is hard granules like dust free pellets. Besides the liquid phase and gas phase classification of activated carbon, into grades based on the chemical properties it possesses such as its methylene blue (MB) value, surface area, ash content, iron content, pH factor and adsorption quality of carbon.

The term activated carbon, active carbon, or active charcoal is usually applied to amorphous carbons possessing higher adsorption capacity than wood or animal charcoal. Many carbon of industrial value are prepared from coal and from organic vegetable and animal matter. The resulting amorphous products include Charcoal coke, and petroleum coke. Carbon as such is probably, the most widely distributed element in nature. It occurs in two allotropic crystalline forms, viz, graphite (hexagonal system) and diamond (isomeric system). The former is soft and weak while diamond is hard and transparent.

A large variety of raw materials are available for the manufacture of these products. Coal, petroleum coke, and wood charcoal are activated by gas activation. Paddy and groundnut husk, saw dust, bagasse molasses, straw, tree bark, bagasse, cocoa bean, shells, bamboo, distillery slop, waste mahua flowers and various industrial wastes have been utilized for the

production of active carbons by chemical activation. Small quantities of activated carbons have been manufactured indigenously on commercial scale from paddy husk, bagasse and filter press mud particularly for use in the refining of gur.

Many carbonaceous materials such as petroleum, coke, saw dust, lignite, coal, peat, wood charcoal, nutshells, and fruit pits may be used for the manufacture of activated carbon, but the properties of the finished material are governed not only by the raw material but by the method of activation used. Activated carbons form two main classes, those used for adsorption of gases and vapors, for which a granular material is generally employed and those used in purification of liquid for which a powdered material is desired.

Due to the expansion of pharmaceutical and vegetable oil industry the demand of activated carbon is expected to rise sharply in the coming years.

Apart from demand in Indian market, there is also huge demand of activated carbon in foreign market for the high quality activated carbon.

It is very clear that there exists very good scope for this product and it can be exploited easily.

#### ***Cost Estimation:***

Capacity	:	1500 Ton/Annum; Composition of Batch Mix, it's a Batch process, one feed 5 Tons finished product will required
Plant & Machinery	:	82 Lakhs
Total Capital Investment	:	313 Lakhs
Rate of Return	:	44%
Break Even Point	:	46%

### ***Information***

- ★ One Lac / Lakh / Lakhs is equivalent to one hundred thousand (100,000)
- ★ One Crore is equivalent to Ten Million (10,000,000)
- ★ T.C.I. is Total Capital Investment
- ★ All costs/amount given in INR ₹
- ★ NPCS can provide customized Detailed Project Report on all the projects
- ★ Visit us at: [www.niir.org](http://www.niir.org) Email : [info@niir.org](mailto:info@niir.org)



### Adhesive (Fevicol Type)

Fevicol type adhesive come under the category of Synthetic resins and latex adhesives are made from Polyvinyl acetate is thermoplastic, odourless, tasteless, non toxic, essentially clear and colourless resin. It has a non Crystalline and relatively branched rather than linear structure. Most grades of resin have somewhat broad molecular weight distribution. They do not melt but soften over a temperature range. The resin is unaffected by sunlight, ultraviolet light and air. further more it will absorb a small amount of water. Polyvinyl acetate is neutral and non-corrosive. The Various grades have good heat stability below 100° C, show slight discoloration at approximately 150° and decompose at 50° C show slight discoloration at approximately 150° C but brittle at 10° C to 15° C. The adhesive industry is currently the most important outlet for polyvinyl acetate. Polyvinyl acetate came into widespread use in 1940's as a synthetic resin substitute for hide glue.

Adhesives are made in various types and may be synthetic or natural. The term synthetic adhesive means the adhesive which is prepared by using synthetic chemical such as synthetic resin. The manufacture of adhesive from synthetic resin is simple and can be started with very little investment. The most advantageous to any type of adhesive as per market demand.

Polyvinyl acetate is now used in adhesives for various applications such as Book binding, Paper bag, Milk Can, Drinking straws, Envelopes, Gummed Tapes, and Foils etc. The vinyl acetate adhesive is also used for lamination, combination of two or more plies of material into a new composite. The introduction of adhesives based on vinyl acetate has introduction of adhesives based on vinyl acetate is used for the manufacture of ploy vinyl acetate (PVA). Polyvinyl alcohol is being imported from countries like Germany, FRP, France, U.K, Netherlands, Japan, Hungary, Italy, U.S.A and Belgium. Synthetic adhesives Produced in India are mostly base on vinyl Acetate Monomers (V.A.M). VAM is used in from of its various derivatives like Polyvinyl Alcohol and Polyvinyl Acetate, Ethyl Vinyl Acetate etc.

There is a very good scope in this sector and new entrepreneurs should venture into this field.

***Cost Estimation:***

Capacity	:	300 MT/Annum
Plant and Machinery	:	11 Lakhs
Total Capital Investment	:	123 Lakhs
Rate of Return	:	49%
Break Even Point	:	38%

**Glue from Leather Waste**

Animal glue was the most common woodworking glue for thousands of years until the advent of synthetic glues such as polyvinyl acetate (PVA) and other resin glues in the 20<sup>th</sup> century. Today it is used primarily in specialty applications such as lutherie, pipe organ building, piano repairs, and antique restoration. Most animal glues are soluble in water, useful for joints which may at some time need to be separated. Alcohol is sometimes applied to such joints to dehydrate the glue, making it more brittle and easier to crack apart. Specific types include hide glue, bone glue, fish glue, rabbit skin glue.

Significant amount of solid waste are produced including trimmings, degraded hide and hair from the beam house process. The solid wastes can represent up to 70 % of the (wet) weight of the original hides. Large amounts of sludge's are also generated. Solid wastes can be utilized to manufacture utilizable products like dog toys, gelatin, glue, shoes etc.

An animal skin consists of about 61% water, 34% fibrous proteins, 1% globular proteins, 2% lipids, 1% natural salts and some other ingredients including pigments. Out of three layers, the epidermis, dermis and the hypodermis it is the dermis which is later transformed into leather. The epidermis primarily composed of keratin has hair which is removed and the hypodermis has flesh and blood vessels which are also removed. In leather processing, the basic operations revolve round cleaning the skin of unwanted inter fibril material through a set of pre-tanning operations in the Beam House, processing the leather permanently by means of tanning and adding aesthetic value during the post tanning process. The starting material in most cases is raw hide or skin which has been preserved temporarily by the addition of common salt.

There is a good scope and market potential for this product. New entrepreneurs should venture into this field.

***Cost Estimation:***

Capacity	:	750 MT/Annum
Plant & Machinery	:	139 Lakhs
Cost of Project	:	335 Lakhs
Rate of Return	:	43%
Break Even Point	:	68%

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### **Adhesives**

An adhesive may be described as a substance which is capable of holding materials or adherents together by surface action. This process of joining the two or more surfaces is known as adhesion.

The basic function of an adhesive is fastening the components of an assembly together and maintains the joined parts together under the service conditions. But the two parts can be bonded by other methods also. The adhesives for bonding assume importance, because the process is fast, easy and economic.

Adhesives are advantageous over other methods of joining materials. Thin films, fibers and small particles that cannot be combined satisfactorily by other techniques are readily bonded by adhesives. Typical examples are laminates of films of various high polymers and plastics, aluminum foil paper, glass wool for insulation, abrasive wheels, paper, tyre cord with tyres, corrugated boards, paper bags, labels, tapes, safety glass, particle board, plywood etc.

Polyvinyl acetate (PVAc) (Vinyl Acetate Homopolymer) includes polymers of all molecular weights formed from the free radical polymerization of vinyl acetate monomer. These homopolymers are sold as latex, emulsion or spray dried solids. The spray dried polyvinyl acetate emulsions can be reconstituted in water, mixed with other adhesive emulsions or mixed with other dry ingredients where they have the ability to be used as a binder in dry mix formulations.

The PVAc emulsions are, by far, the major form in which polyvinyl acetate is used in the adhesive market. PVAc emulsions exhibit excellent compatibility with many modifying resins, lending themselves to a broad range of applications through formulation. In addition to compatibility, molecular weight (or grade) and the amount and type of protective colloid used to produce the emulsion affect adhesive properties.

PVAc homo-polymers are the lowest cost emulsions while possessing good adhesion to many porous surfaces such as wood and paper.

Packaging and furniture applications involving paper and wood substrates constitute over 90% of the usage of PVAc emulsion adhesives. The balance of the usage involves a wide variety of applications, including consumer white glue. The packaging applications include boxboard manufacture, paper bags, paper lamination, tube winding and remoistenable labels. In construction, PVAc is used in prefab construction, including flooring and panel installation. PVAc is not generally used as a primary fastener where great strength is needed.

The market size of all types of adhesives is very large and growing. Of this, the premium products account for some 45%. Quantitatively, the overall

market size is growing annually at 11%. In India the adhesive industry players are Pidilite, 3M India, Huntsman, National Starch, Bostik Findley, Sika, Industrial Adhesives, Anabond, Seagull Industries, Metlok and others.

There is a very good scope in this field and new entrepreneurs should venture in this sector.

***Cost Estimation:***

Capacity	:	900 MT/Annum PVA Adhesive 300 MT/Annum Polyurethane Based 300 MT/Annum Synthetic rubber Based 300 MT/Annum Water Proofing Compound Liquid 300 MT/Annum Water Proofing Compound Powder
Plant & Machinery	:	58 Lakhs
Total Capital Investment	:	252 Lakhs
Rate of Return	:	41%
Break Even Point	:	62%

***Information***

- ★ One Lac / Lakh / Lakhs is equivalent to one hundred thousand (100,000)
- ★ One Crore is equivalent to Ten Million (10,000,000)
- ★ T.C.I. is Total Capital Investment
- ★ All costs/amount given in INR ₹
- ★ NPCS can provide customized Detailed Project Report on all the projects
- ★ Visit us at: [www.nir.org](http://www.nir.org) Email : [info@nir.org](mailto:info@nir.org)

## Chapter

## 5

## ALCOHOLIC BEVERAGES

### Beer Plant

Beer is the world's most widely consumed alcoholic beverage; it is the third most popular drink overall, after water and tea. People of different countries take beer in varying much like a soft drink in European countries; it is just a substitute of water. The alcoholic contents and main source stuff also keep varying according to the tastes of the major part of population of the particular country although it is a fashion to ask for beer of every origin in every country. Formulations of beer manufacturing are done with the view of availability of the raw materials in that particular part of the World where the brewery is proposed to be established. In most of the parts of the world, barley is a universal source of beer extraction. But, beers are manufactured from Chamomile flowers and powdered gingers etc. The strength of beer is usually around 4% to 6% alcohol by volume (abv) though may range from less than 1% abv, to over 20% abv in rare cases.

### Applications

Beer is drink primarily as a source of liquid and for its pleasant & refreshing taste; none the less, its nutritional properties are of great importance. The calories content of beer is significant but not special high. A 355 ml. bottle of average beer yields approximately 143 Kcal of energy. The normal daily intake is 2400 K cal. The calories are provided by the unfermented, residues and alcohol. Alcohol also replaces Carbohydrates, fats, proteins, so that there may be a gain in body weight. Beer also contributes to mineral requirements of the body and supplies useful quantities of vitamin B complex. A special use of beer is for the control of sodium intake in the treatment of disease e.g. congestive heart failure, high blood pressure and certain Kidney and liver ailments. Beer cannot (because of its low pH say 4.2), harbor any pathogenic germs. The content of nourishing components is all in dissolved form. Beer is free from fat; it acts as a diuretic and promotes the formation of gastric acid acting as an appetite inducer. The alcohol in the beer is effective according to the amount & concentration.

### Global Demand

Beer is a popular beverage all over the world. Though an alcoholic beverage beer is not considered a hot drink like rum or whisky as it contains alcohol ranging from only 8 to 9 percent. Presently, some 36 units are manufacturing beer in India with an estimated output of 500 million liters. In consumption, India holds the 29th position with the annual consumption growing by a little less than 30% in the last five years. The growth of Indian beer industry in recent years has been fast. From 100 million cases in 2006, the Rs. 30 billion Indian beer market seems set to register a further growth of 8.5% in 2006-07, thanks to the spurt in beer consumption in Punjab, Haryana and Delhi. Total market of beer was estimated at Rs. 60 billion in 2007-08 which showed an increase of 23% over that of the preceding year. The annual growth in the Indian beer market has been around 8% in the recent years, which compares well with the growth in China. But the Chinese market is over 25 times more than the Indian market of over 900,000 kilolitres. Sales turnover increased for most of the companies in 2008-09, while net profit declined in the same period. For major companies like United Spirits and United Breweries sales increased by around 22-24% in 2008-09. In the case of United Spirits, net profit declined by 5% in 2008-09, while that of United Breweries declined marginally by 1% in the same period. It is estimated that the demand of beer in 2010-2011 was 12.12 MT and it will be 15.26 MT till 2015.

The demand of beer in the market is immense and therefore its market position is splendid. Hence it is an excellent field to venture.

### *Cost Estimation:*

Capacity	: 3000000 Litres/Annum
Plant and Machinery	: 403 Lakhs
Total capital investment	: 959 Lakhs
Rate of return	: 45%
Break Even Point	: 47%

### Beer & Wine

Drinking practices vary substantially among different countries and different masses. But both alcoholic beverages are very popular among all ages of people. The alcoholic drinks market is broadly classified into five classes, starting from beers, wines, hard liquors, liqueurs and others.

The market is stocked with different types of alcoholic beverages, differing in terms of alcohol content. There are some alcohol beverage types that are low in alcohol content like beer. Beer has an alcohol content of about 3-8% and wine consists of approximately 7-18% alcohol concentration. The alcohol content of certain alcoholic beverages can be increased by adding on distilled products. Beer is one of the oldest and probably the most popular alcoholic beverage in the world. It is sometimes even referred to as "liquid bread".

Distinctive alcoholic beverages differ in terms of their aging process like beer that undergoes a process of short fermentation, lasts for about a week or so. On the contrary, wine, which involves a longer process of fermentation, has a long aging period lasting many months or even years. Beer is usually made from barley, whereas wine can be made with different fruits like plums and cherry, but usually the wine that can be found in the market is made from grapes. Certain kind of alcohol beverages contains anti-oxidizing chemicals like phytochemicals. The phytochemicals are basically found in good quantity in wine. Alcoholic beverages are said to be beneficial if taken in limited amount to increase the appetite. Excess consumption may lead to several other biological problems.

Liquor industry has always remained under strict governmental control in terms of capacity creation, distribution, taxation. While overall public perception spells restraint, it is the symbol of high life even in puritan India. The branded liquor industry is growing at a rate around 10 to 12%. The total consumption of liquor in India was nearly 100 million cases of beer and 60 million cases of whisky and other spirits in fiscal 2005-06. The consumption expanded by nearly 10% in 2006-07 to reach over 110 million cases of beer and about 70 million cases of whisky and other spirits.

The growing popularity of wine in India is generating lots of interest among big and small wine producers. This is also reinforced by the fact that the cost for opening and setting up of wine plants with capacity of around 100,000 ltrs comes only to somewhere between Rs 10-15 million mark. As a result many entrepreneurs, Indian and foreign, are entering in this sector. Total market of wines, spirits and liquors was estimated at Rs. 127.27 billion in 2007-08, which represents an increase of around 16% over that of the preceding year. The annual growth in the Indian beer market has been around 8% in the recent years, which compares well with the growth in China.

A feather in India's alcoholic drinks industry is that India's McDowell's No.1 brandy has emerged as the highest selling brandy globally, pushing the world famous E&J Gallo to the second spot. Other global majors at the top included Presidente brandy (Allied Domecq), Wilyhever Goldkrone (Graflich von Hardenberg'sche Kornbrennerei) and Chantre (Eckes) occupying the next three spots among the top five. Nearly 62.5 million people in India drink alcoholic beverages. The per capita consumption of alcohol is 4 liter per adult per year. About 17% of adult men are addicted to alcohol. Over 65% of alcohol produced in South East Asia is from India. India produced 4 million tonnes of alcohol in 2006-07. Besides, it imports 7% of the total alcoholic beverage imports in the region. The factors that make India a promising market is the changing demographics - youth and middle-aged persons will constitute 54% of the population in 2011, as against about 50% in 2006, adding 20 million to the drinking age population annually. Changing lifestyle has also seen the number of Indian drinkers rise from 1 in 300 two decades ago to more than 1 in a 20 today. It is apprehended to grow to 1 in 5 by 2011.

There is a very good scope and ample space for entry for new entrepreneurs into this sector.

***Cost Estimation:***

Capacity	:	1800 Kl/Annum (Beer) 1890 Kl/Annum (Wine)
Plant & Machinery	:	945 Lakhs
Cost of Project	:	1971 Lakhs
Rate of Return	:	44%
Break Even Point	:	55%

**Rice Beer**

Rice beer is an alcoholic drink generally made from rice. Those who consume moderate amounts of beer (one to two a day at the most) have a 30-40% lower rate of coronary heart disease compared to those who don't drink. Beer contains a similar amount of 'polyphenols' (antioxidants) as red wine and 4-5 times as many polyphenols as white wine.

Alcohol has also been attributed of its ability to increase the amount of good cholesterol (HDL) into the bloodstream as well as help to decrease blood clots. Beer also contains vitamin B<sub>6</sub>, which prevents the build-up of amino acid called homocysteine that has been linked to heart disease. Those of us who have high levels of homocysteine are usually more prone to an early onset of heart and vascular disease. A new study performed at the TNO Nutrition and Food Research Institute in Utrecht indicates that those who drink beer had no increase in their homocysteine level but those who drank wine or liquor had an increase of up to 10%. Also noted was the fact that those who drank beer experienced a 30% increase in vitamin B<sub>6</sub> in their blood plasma, thereby proving that beer (in moderation) is actually healthier to drink than other alcoholic drinks.

It is possible to use 100 per cent rice and some locally grown additives in the production of beer. The idea of using 100 per cent rice in beer brewing is that rice is available in almost all countries particularly in Asia. The whole tedious process of beer making was conducted. During the process, three stages were done to malt the rice steeping, germinating and kilning. The rice is found to be a good material in beer mainly because it is a good source of starch. The properties of barley are not so different from rice. Both grains have husks that are advantageous due to their less fat and protein content and can form filter bed during mashing. Additives such as hops, duhat can be used to improve the flavor, aroma, and color of beer. The technology that uses 100% rice in beer production is first in the country, offer the consumers with an alternative, low cost, and high quality product, aside from creating additional livelihood and helping the economy in saving our foreign exchange. Of the rice going to the domestic market roughly 60% goes to table rice, about 25% to the industrial market and processed food, and about 15% to beer.



Presently, some 36 units are manufacturing beer in India with an estimated output of 500 million liters. The market for beer in India was about 65 million cases of 12 bottles each and is slated to touch 10 million cases in 2005-2006, a growth of 23% in a year. In consumption, India holds the 29th position with the annual consumption growing by a little less than 30% in the last five years. Per capita consumption of beer is as low as half-a-liter as against 128 liters in Germany, 129 liters in New Zealand and 116 liters in Denmark. Even China has a per capita consumption of 20 liters. Against India's 5-million hl, China's market is 165-million hl. The Indian industry has a capacity of little less than 7 million hl. Andhra Pradesh is the third largest consumer of beer after Maharashtra and Tamil Nadu. While Maharashtra consumed a million hectoliters; Tamil Nadu is at 850,000 and Andhra at 800,000 hl.

India presents a huge growth potential for alcoholic beverages sales. The domestic production of alcoholic beverages is on the rise, especially beer with official statistics reporting a 12 per cent increase in domestic beer production. Increasing GDP, favourable growth in the demographics with a growing urban middle class, growth of modern retail formats, hopeful rationalization of the taxation rules and ban on local country liquor and rising health consciousness, age preferences will act in favour of the growth of both alcoholic (beer and wine) beverages in India in the near future.

All new entrepreneurs venturing into this field will find a future which is very promising and bright.

#### *Cost Estimation:*

Capacity	:	30000 Thousand Beer Bottles
Plant & Machinery	:	1325 Lakhs
Cost of Project	:	2230 Lakhs
Rate of Return	:	45%
Break Even Point	:	49%

#### **Indian Made Foreign Liquor**

Indian made foreign liquor is prepared from ethyl alcohol of different concentration with added flavour and coloured bottled hygienically. In India there are about 280 units engaged in the production of alcoholic brandy, whisky, beer & other beverages. The installed capacity of all those units is estimated of the order of 1400 to 1450 million liters per annum. India has been exporting alcohol in substantial quantities. The estimated growth rate of demand is 20% per annum with increase in population and other industrial growth and consumption. There is good scope for new comers.

#### *Cost Estimation*

Plant Capacity	:	10,000 Btls/Day
Plant & Machinery	:	Rs. 201.0 lakhs
W.C. for 3 months	:	Rs. 150.0 lakhs
Total Capital Investment	:	Rs. 450.0 lakhs
Rate of Return	:	50.93 %
Break Even Point	:	44.86 %

## Chapter 6

## ALUMINIUM AND ALUMINIUM PRODUCTS

### Aluminium Extrusion Plant

Extrusion is a process equally suitable for the simplest shapes and for the most complex for the wide range of large and the small items for structural members or for decorative trim. Some sections produced by extrusion cannot be made by other process economically. The two main advantages of this process over other manufacturing processes are its ability to create very complex cross-sections and work materials that are brittle, because the material only encounters compressive and shear stresses. It also forms finished parts with an excellent surface finish. Aluminium sections made by the extrusion process offer many advantages.

The aluminium industry can be categorized into two principal segments. The key segment is the production of primary aluminium by integrated producers engaged in the entire value chain from the mining of bauxite in an alumina refinery, and conversion of alumina into primary aluminium metal. The second principal segment consists of secondary or downstream producers who are engaged in the manufacture of value-added semi fabricated aluminium products such as rolled products, extrusions and foils. The cost of an extruded aluminium sections depends on many factors such as alloy, temperature, overall size, weight per meter, complexity of design, quantity and tolerance requirements. As a general rule the cost per meter of an extrusion increase where high strength alloys are used and it decreased in range that designers have it's yet fully exploit the possibilities of sections made in this way.

The extrusions segment is the preserve of the secondary producers with nearly 40 players, such as Jindal Aluminium, Century Aluminium, Sudal Industries, Bihar Extrusions and Bhoruka Aluminium, which account for over 80 per cent of the aggregate production capacity of tonnes. Primary aluminium producers such as INDAL, HINDALCO, MALCO AND BALCO account for the remaining of production capacity. The capacity overhang can be gauged from the fact that as against an aggregate capacity of tonnes, the domestic demand is currently only around tonnes. The dependence on exports will be critical to the survival of the secondary, players in the extrusion markets.



Extruded aluminium products are finding growing exports prospects. Aluminium extruded products are mainly tubes, pipes and blanks. These are manufactured in various forms and can be broadly classified in (a) rods & (b) sections. Sections include hollow and solid sections. In extrusion, the cylindrical rod called billet, is squeezed hydraulically into any shape by forcing the hot billet through the die orifice. Extrusion presses of various sizes are available ranging from 200 ton to 5000 tons capacity. These presses can be designed from simple to very complicated type with intricate and most sophisticated component.

Aluminium extrusion products are widely used in transport industry, railroads, electronics and housing industry etc. Extrusion process achieves cheaper, lighter and neater products. HINDALCO, BALCO, INDAL, and Jindal extrusion Ltd are the major producer in this segment. The extrusions market is expected to grow at an annual rate of eight percent over the next few-year.

The exports of aluminium-extruded products are gradually on rise. Afghanistan, Algeria, Bahrain, Bangladesh, Burma, Hong Kong, Kenya, Kuwait, Oman, Sri Lanka, U.A.E. etc. are the main middle East countries to whom aluminium extruded products like tubes, pipes and blanks are being exported. At present aluminium extrusion products have penetrated a large area of applications and are manufactured in India with or without foreign collaborations. It requires moderately high level of technology and investments but the industry is quite profitable and finds ready market within and outside the country. Demand for aluminium is driven by use in growth industries such as aerospace, and characteristics such as light weight and recyclability make it increasingly attractive for use in cars and consumer electronics.

India is the eighth leading producer of primary aluminium in the world, with total production amounting to over 1,200 KT. The country has witnessed significant growth in aluminium production during the past five years. The Indian aluminium market is growing at a rapid pace and it is one metallic industry where India can emerge as a powerhouse within the next decade. According to industry sources, India with total bauxite reserves of about 3 billion accounts for almost 7.5% of the world's 65 billion bauxite reserves and is ranked sixth among the countries with highest bauxite reserves. Indian bauxite reserves are expected to last over 350 year with proven and probable reserves is estimated at 1200 Mt. The worldwide alumina production competence is around 58 million tonnes in which India have 2.7 million tons, being the fifth largest producer, after Australia, Guinea, Brazil and Jamaica. The Indian aluminium market is growing at a rapid pace, yet per capita consumption is extremely low: With over 7% growth per annum, one of the highest in the world, the Indian aluminium market is booming. Even better, sectors that extensively use aluminium are themselves booming, ensuring that this sector stays firmly on the growth path for times to come.

The complete range of plants and machinery are available indigenously and compare well with imported extrusion plants. Looking at the future scopes

for aluminium and aluminium extruded sections, it can be foreseen that new entrepreneurs will find it quite attractive to come up with good production targets.

***Cost Estimation:***

Capacity	:	2400 MT/Annum
Plant & Machinery	:	318 Lakhs
Cost of Project	:	738 Lakhs
Rate of Return	:	44%
Break Even Point	:	58%

**Aluminium Secondary Billet Casting Plant**

The 20<sup>th</sup> century has seen the emergence of aluminium as a key industrial and strategic material, second to only steel in terms of importance and tonnages of production. Beginning with an experimental production of 1.7 tonnes in 1859, the world production of primary aluminium has grown to about 16 million tonnes in the year 1983-recording in the produces the fastest rate of growth of consumption for any metal. A point to notice is the upsurge in production synchronizing with the two world wars pointing to the need for aluminium as strategic material.

In today's industrial civilization, aluminium is important because it serves as a basic input for a number of industries; it is indispensable for building up and strengthening the industrial infrastructure in the basic sectors viz. power and transportation besides finding extensive use in other vital sectors like space, defense, buildings, construction, domestic hardware's etc.

Aluminium is a metal with high strength-to-weight ratio, better formability, and high ductility, anti-corrosive properties, with thermal and electrical conductivity. Because of these unique combinations of properties, aluminium (including its alloys) has substantially replaced a number of traditional materials from their established uses e.g. steel, copper, lead, zinc among metals and glass, wood and paper among non-metals. Aluminium is crucial for expansion of power availability and electrification programme.

It has a significant role to play in saving energy in transportation sector, thus help reducing the consumption petroleum products. Aluminium plays a key role in the progress of industrial development because it serves as basic input for a number of industries from its use as a strategic metal.

In view of the present day energy and fuel crisis and the need for preservation of forests for ecological balance, application of aluminium in place of steel and wood in transport sector, which has high growth potential, has become more important especially because aluminium with its inherent properties of light weight, high strength-to-weight ratio, non-corrosive, tensile strength consumes less fuel.

Building and construction industry has now started evincing keen interest in the use of aluminium as it replaces wood and thereby promotes conservation of the fast depleting forest wealth.

Development of high strength alloys good formability, improved casting and welding techniques have opened up wide areas of application of aluminium in the machinery and equipment sector. Another important area is the utensils, household appliances and consumer durables. Aluminium due to its conductivity, lightweight, durability and non-toxicity constitutes the most fuel-efficient and hence the ideal material for kitchenware's. Widespread usages of aluminium utensils is, therefore, necessary in the larger context of fuel saving.

The global aluminium industry has undergone remarkable changes in the recent past and the outlook for the metal is quite optimistic in the coming years, as the global demand is expected to grow by eight percent in the next few years. The aluminium production is moving forward at full pace worldwide with the notable increase in demand for the metal, as a result of developments in the traditional areas of its application. Though the rate of growth of the aluminium industry is relatively low in the developed countries, having already reached a peak, in developing countries of Asia like India and China, an accelerated growth can be expected. Globalization has opened up a worldwide market for the metal and along with it new challenges and opportunities to be faced by the industry. New entrepreneurs should venture into this field.

***Cost Estimation:***

Capacity	: 21500 MT/Annum
Plant & Machinery	: 410 Lakhs
Cost of Project	: 2020 Lakhs
Rate of Return	: 43%
Break Even Point	: 63%

**Alumina from Bauxite**

Bauxite ore is an important mineral used in producing alumina, the raw material that is in turn used for producing aluminum. Approximately 85% of Bauxite is converted into alumina, 5% is used in non-metallurgical bauxite applications, and the remaining 10% is utilized in other applications. Leading countries contributing for about 70% of the total mined bauxite include Australia, Guinea, Brazil and Jamaica. On the other hand, Australia, the United States, China and Jamaica account for approximately 60% of the world's alumina production. Asia-Pacific is expected to remain the fastest growing as well as the largest Bauxite and Alumina Market. Europe, the second largest market, is projected to register sales of 52 million metric tons by 2010.

The worldwide capacity to produce alumina was placed at around 80 mn tonnes in 2007 and was slated to touch 100 mn tonnes in 2010. Alumina accounts for about 22% of the cost in the production of aluminium.

India's share in world aluminium market is estimated at around 3%. India ranks fifth in bauxite production after Australia (62 mn tonnes), Guinea (17.50 mn tonnes), Brazil (16.20 mn tonnes) and China (10.75 mn tonnes). With a total output of 9.25 mn tonnes, the country contributes about 6% of the world's total production of 159 mn tonnes. India holds the fifth position in reserves base and is ahead of China with 2300 mn tonnes. India ranked seventh in alumina production with a total output of 3 mn tonnes, a share of nearly 5% of the global production of 61 mn tonnes.

About 25% of all bauxite mined is used for producing abrasives, catalysts, adsorbents, and other industrial chemicals.

Bauxite in India is available in Katni, Belgaum, Kohlapur, Ranchi, Lohardanga, Bhopal, Orissa, Andhra Pradesh. A reserve of about 571 million tons has been estimated from 25 deposits in Visakhapatnam and East Godavari District. These gibbsite bearing deposits have an average  $\text{Al}_2\text{O}_3$  of 46.76% with low silica (4%) and titanium (2%) but high in iron (8-28%) and are best suited for alumina extraction by the Bayer's process under low P.T. conditions. Other uses are in the cement industry, in the manufacture of ferric alum & aluminous chemicals. Demand for aluminium is estimated to grow at 4 to 6% per annum. The demand for the metal is expected to pick up as the scenario improves for user industries like power, infrastructure and transportation, which are all on the move.

There is a good market potential and scope to venture in this field.

***Cost Estimation:***

Capacity	:	19998 MT/Annum
		Pure Alumina from Bauxite
Plant & Machinery	:	671 Lakhs
Cost of Project	:	2113 Lakhs
Rate of Return	:	43%
Break Even Point	:	48%

**Aluminium Pilfer Proof Caps**

Pilfer Proof Caps (P.P. Caps) are popular all over the world which provide not only the above mentioned qualities to the bottle contents, but also a perfect seal which guarantees non-contamination from external environments. This ensures the contents to remain unaffected from atmospheric moisture, gases, dusts and other impurities.

Aluminium made pilfer proof caps do not prove too costly and it is easily available because raw material is available in abundance on the earth. It is easy to process aluminium sheets with the aid of a normal press shop.

Most of the manufacturers make use of pilfer-proof caps to seal the bottles so as to avoid any adulteration of the product once it has been transported from the factory. These caps also provide a sealing so that the product is not affected by the environmental conditions during storage and transit. Pilfer-proof caps are screwed on the bottle mouths and clamped in position so that unless turn out they cannot be unscrewed. The caps are painted and generally printed with brand names and instructions for opening. With increases in the consumption of bottled products in areas like drug industries, hair oil, cosmetics, fruit, juices, liquid detergents and many other products, the demand of pilfer-proof caps is increasing. There are usually made of aluminium sheets in different sizes.

Aluminium pilfer-proof caps are used in mostly liquid containing bottles, juices and other food products, drugs etc. They can easily be opened with slight pressure. It ensures non-adulteration or pilfering. Pilfer-proof caps are used in Beer, Wine, Juices, Medicines, Hair oil, and Petroleum products industries.

The demand for pilfer-proof caps are directly linked with the growth and expansion of its consumer industries. There are various types of pilfer-proof caps available in the market of various size and shape and with deferent raw materials. Since there is a continuous increase in the industries manufacturing medicines, aerated water, hair oil, soft and hard drinks, the demand of these items is on increase.

The demand of aluminium pilfer-proof caps increasing day by day. So, there is a good scope of enter in this field.

***Cost Estimation:***

Capacity	:	160000 Nos/Day
Plant & Machinery	:	14 Lakhs
Total Capital Investment	:	128 Lakhs
Rate of Return	:	50%
Break Even Point	:	38%

### Fastener (Automatic Cold Forge Process)

A fastener is a hardware device that mechanically joins or affixes two or more objects together. Fasteners mainly cover nuts, bolts, screws, studs and rivets and are segmented between MS (mild steel) and HT (high tensile) fasteners. These fasteners are used in engineering systems. All types of fasteners, except high tensile and special type fasteners, are reserved for the SSI sector. Bolt is cylindrical piece of metal that fasten objects together. It is a piece of steel forged at one end to make hexagonal, square or round head and the shank fully or partially threaded at the other end. Nut is hexagonal or square piece with a threaded hole at the centre. Bolts and nuts can be zinc or cadmium plating to resist corrosion.

### Application

- ★ Bolt and nut are used to fasten together loose parts mainly in industries and workshops.
- ★ In construction connectors between structural members bolt connections are used when it is necessary to fasten two elements tightly together.
- ★ Threaded metal bolts are always used in conjunction with nuts.
- ★ Another threaded partner is screw, which has countless application especially for wood construction.
- ★ The wood screw carves a mating thread in the wood, ensuring the tight fit.
- ★ Pins are used to keep two or more elements in alignment; since the pin is not threaded, it allows for rational movement, as in machinery parts.

The general applications of various objects having screw threads are:

**Fastening:** screws, nut-bolts and studs having screw threads are used for temporarily fixing one part on to another part.

**Joining:** e.g., co-axial joining of rods, tubes etc. by external and internal screw threads at their ends or separate adapters.



Clamping: strongly holding an object by a threaded rod, e.g., in c-clamps, vices, tailstock on lathe bed etc

### Indian Scenario

The Indian Fastener Industry is estimated to have a domestic market of around INR 1500 crore. Automobile industry is the biggest consumer of fasteners. Mild steel fasteners are primarily manufactured by the unorganized sector while the high tensile fasteners require superior technology and dominated by companies in the organized sector. The organized sector commands nearly 70 percent of the fasteners market while the rest is controlled by the unorganized sector and imports.

### Global Scenario

Global demand for industrial fasteners is projected to increase 4.8 per cent annually to US\$ 66 billion in 2012. All types of fasteners, except high tensile and special type fasteners, are reserved for the SSI sector. Total market size of the fastener industry is estimated at around ₹272 m in revenues. Fasteners market can be classified into mild steel (MS) and high tensile (HT) fasteners. MS fasteners constitute about 30% of the market size and are mainly produced by the unorganized sector, while HT fasteners are produced primarily by the organized sector. Automobile sector is the major demand driver for the bearing industry and constitutes almost 50% of the total demand in value terms. The bearings industry consists of bimetal bearings and anti-friction bearings. The anti-friction bearings comprise ₹270-360 million of the bearings market and bimetal bearings comprise the rest of the market. Imports comprise approximately 25-30% of the total market.

Therefore the scope for this product is very bright. An entrepreneur venturing into this project will find it very lucrative.

#### *Cost Estimation:*

Capacity	:	2400 MT/Annum
Plant and Machinery	:	120 Lakhs
Cost of project	:	417 Lakhs
Rate of return	:	42%
Break Even Point	:	59%

### Tyres and Tubes for Bicycle and Rickshaw

Tyres and Tubes are the backbone of the bicycle and rickshaw. Bicycle and rickshaw continues to be the principal mode of transport for the low and middle income families. This is because the bicycle is both environment and people friendly. India is largest producer of bicycle next to only china. The

future of the bicycle industry is bright. However, for survival the companies have to successfully restructure and modernize to achieve global competitiveness in terms of quality, cost and distribution system. The tyre & tube industry is a major consumer of the domestic rubber production. Cycle rickshaw is a local means of finance and also known as pedicab, cycle or rickshaw in different parts of the world. Cycle rickshaws are human powered i.e. pulled by a person by foot.

There is very good domestic as well as export demand of bicycle and rickshaw tyres and tubes. The entrepreneurs venture in to this project will be successful.

***Cost Estimation:***

Capacity	:	300000 Nos. Tyres & 300000 Nos Tubes
Plant & Machinery	:	158 Lakhs
Cost of Project	:	351 Lakhs
Rate of Return	:	42%
Break Even Point	:	55%

**U-Bolts and Centre Bolts**

Bolts in various dimensions & head-shapes are available. Bolts, preferably used in through holes with the help of an appropriate nut, are generally with of square/hexagonal heads. Bolts can be supplied unfinished, semi-finished & fully finished conditions. Automotive bolts have hexagonal head. These bolts have greater head depth than regular bolts but have less width across flats. Limits of tolerances are well defined by international standards for over all dimensions. Top of the head is flat and chamfered at an angle 30° while the bearing surface is washer-faced. Either coarse or fine threads of class-2A are used.

Leaf springs are used in automobile vehicles as suspension members. There are two basic types of leaf springs: Multi leaf spring, and Single leaf spring.

The multi leaf spring is made up of a series of flat steel plates of graduated length placed one above the other. These plates or leaves are held together at the centre by a centre bolt which passes through concentric holes made in all the leaves. The longest or 'master leaf' is rolled at both ends to form spring eyes through which bolts are placed to attach the spring ends.

U-bolts are used at appropriate distances on the length of leaf springs to hold all the individual leaves intact at their places. This means that with each leaf spring, one centre bolt and more than one U-bolt are used in any leaf spring design. U-bolts and centre leaves are also used on loco suspension leaf springs like auto leaf springs by cold forging of special alloy steels which

is the proper technique to make such high tensile bolts. Header, pointer, trimmer and mechanical/hydraulic thread rolling operations are successively undertaken on selected alloy steel wire/rod coil to manufacture bolts. Thereafter, these are drum washed, degreased and dried prior to heat treatment. Also phosphating and zinc plating can be done on these bolts to protect surface from erosion/corrosion. Technical know-how for these bolts is indigenously available. U-bolts are made by press bending straight bolts threaded at both ends. 10 mm to 25 mm steel rods are used as the starting raw material for making these bolts, depending on size of the leaf spring.

Fasteners mainly cover nuts, bolts, screws, studs and rivets and are segmented between MS (mild steel) and HT (high tensile) fasteners. These fasteners are used in engineering systems. All types of fasteners, except high tensile and special type fasteners, are reserved for the SSI sector.

The overall fasteners market is estimated at about Rs 28 billion. While the organized sector (HT fasteners) has a share of 65%, the balance of 35% is shared by unorganized sector and imports. The imports in 2006-07 were Rs 8 billion, leaving Rs 2 billion or 7% as the market for the unorganized sector in value terms. The market is heavily dependent on imports which have been growing at close to 28.5% in recent period. The boom has been due mainly to the upswing witnessed by the automobile sector, the main end-user industry, accounting for almost half of the demand for fasteners.

There is a very good scope in this sector and new entrepreneurs should venture into this field.

***Cost Estimation:***

Capacity	:	U-Bolt & Nut 600 MT/Annum Bolt & Nut 900 MT/Annum
Plant & Machinery	:	162 Lakhs
Cost of Project	:	343 Lakhs
Rate of Return	:	42%
Break Even Point	:	57%

**Bicycle Tubes and Motorcycle Tubes**

Bicycle and motorcycle tubes are the backbone of the bicycle and motorcycle industries. Few numbers of companies in the organized sectors are engaged in the quality grade cycles tyres and tubes and few unorganized sector are also engaged in manufacturing bicycle tyre and tubes. An inner tube is basically a doughnut-shaped balloon, with a valve for inflation. The only requirement for an inner tube is that it should not leak. Being rubber, they have no rigid structure. If an inner tube is inflated outside of a tire, it will expand to 2 or 3 times its nominal size, if it doesn't explode first. Without being surrounded by a tire, an inner tube can't withstand any significant air pressure. Most of the basic raw materials are indigenously available but there is short

supply of natural rubber and butyl rubber, it is required to import. Basic technology is also indigenously available in India. Plants and machineries are indigenously available.

The market for tubes for bicycle and motorcycle is directly related to the demand for bicycle and motorcycle. Every bicycle and motorcycle manufactured will need a tube for its tire. So an analysis of bicycle and motorcycle production will provide a clear picture of demand for tubes. With a production of about 4.5 million vehicles in 2001-02 and over 8.5 million vehicles now, India is the second largest producer of 2-wheelers worldwide, which includes motorcycles, scooters and mopeds.

There has been a steady growth in the demand for motorcycles in India. It has become a youth icon, particularly among the urban youth charged by speed and style which motorcycles impart to their personality. The motorcycles overlook scooters in 1998-99 and have not looked back. The scenario for 2006-07 conformed to the sustained performance in the recent past with sales at over 7 million, higher by over 16.5% on the preceding year's sales. In 2008-09 (first 8 months) sales at 2.85 million were higher by 14.5% than in the comparable period of 2007-08.

The total market of motorcycles was estimated at Rs 220 billion in 2007-08, a decline of 5% over that of preceding year. The growing demand of 2/3 wheelers and bicycle will definitely give rise to high demand of tubes in the coming years. There is a good market potential and good scope for all new entrepreneurs to venture into this sector.

***Cost Estimation:***

Capacity	:	300000 Nos. Bicycle Tubes 300000 Nos. Motorcycle Tubes
Plant & Machinery	:	105 Lakhs
Cost of Project	:	240 Lakhs
Rate of Return	:	43%
Break Even Point	:	50%

**Plastic Injection Moulding Plant for Auto Parts**

Plastic Injection moulding is a manufacturing process for producing parts from both thermoplastic and thermosetting plastic materials. Material is fed into a heated barrel, mixed, and forced into a mould cavity where it cools and hardens to the configuration of the mould cavity. After an industrial designer or an engineer designs a product, usually, moulds are made by a mould maker (or toolmaker) from metal, usually either steel or aluminium, and precision-machined to form the features of the desired part. Injection moulding is widely used for manufacturing a variety of parts, from the smallest component to entire body panels of cars. It is also used to create many things such as wire spools, packaging, bottle caps, automotive dashboards, pocket combs,

and most other plastic products available today. Injection moulding is the most common method of part manufacturing. It is ideal for producing high volumes of the same object. Some advantages of injection moulding are high production rates, repeatable high tolerances, the ability to use a wide range of materials, low labour cost, minimal scrap losses, and little need to finish parts after moulding.

India's automotive industry is expected to grow in another ten years. The Indian automotive industry is growing at a very high rate with sales of more than one million passenger vehicles per annum. The overall growth rate is 10-15 per cent annually. The entire car market was likely to witness a fair amount of churning in the coming years. This will definitely be a driving force for a high demand of auto components. India is the world's second largest manufacturer of two-wheelers, fifth largest manufacturers of commercial vehicles as well as largest manufacturer of tractors. It is the fourth largest passenger car market in Asia and home to the largest motorcycle manufacturer.

Coming to the Auto-component sector, the total market size of the auto-components industry is estimated at over Rs 700 billion. The industry estimates that the Indian components industry will grow over Rs 950 billion by 2010. The overall investment in the components industry is estimated at Rs 288 billion. Indigenous firms like Bharat Forge, Sundaram Fasteners, Minda Industries and Gabriel India Ltd. are in the limelight. There is a boom in the auto components segment because of strong demand and robust economy. Also, the industry has strong forward and backward linkages with almost every other engineering segment. The component production range includes engine parts 31%, drive transmission and steering parts 19%, suspension and braking parts 12%, electrical parts 10%, equipments 12%, body and chassis 9% and others 7%.

The auto component suppliers are emerging as systems suppliers with capacity to design and develop critical parts. The Indian automobile components industry has, no doubt, significant cost advantages, primarily due to lower labour cost. There is a very wide scope and good market potential of products manufactured in this sector.

***Cost Estimation:***

Capacity	:	300000 Nos. Car Fender 75000 Nos. Car Bumper 75000 Nos. Car Dash Board Per Annum
Plant & Machinery	:	1055 Lakhs
Cost of Project	:	1401 Lakhs
Rate of Return	:	45%

### **Brake Fluid**

Brake fluid is one of the most important components in a braking system. It is a type of hydraulic fluid used in brake applications in motorcycles, automobiles and light trucks. It is used to transfer force under pressure from where it is created through hydraulic lines to the braking mechanism near the wheels. It works because liquids are not appreciably compressible. Braking applications produce a lot of heat so brake fluid must have a high boiling point to remain effective and must also not freeze under normal temperatures. These requirements eliminate most water-based solutions. The quality and safety of a brake fluid is defined by its boiling point.

Brake fluid can come in a number of forms, standardized under the DOT (Department of Transportation) standard. DOT 2 is essentially castor oil; DOT 3, DOT 4, and DOT 5.1 are composed of various mineral oils, glycol esters and ethers; and DOT 5 is silicone-based. Most cars used in the US use DOT 3. DOT 3 is one of several designations of brake fluid denoting a particular mixture of chemicals imparting specified ranges of boiling point. DOT 3 like DOT 4 is a polyethylene glycol based fluid. Fluids such as DOT 3 are hygroscopic and will absorb water from the atmosphere. This degrades the performance of the fluid by drastically reducing its boiling point. In a passenger car this is not much of an issue, but can be of serious concerns in racecars or motorcycles. DOT 4 is one of several designations of brake fluid denoting a particular mixture of chemicals imparting specified ranges of boiling point. The glycol brake fluids are in good demand and many manufacturers compete in a large market. Different mixes would be used depending on the aim, e.g. low price, good race performance, low moisture absorption for long life, etc.

Glycol based fluids are two times less compressible than silicone type fluids, even when heated. Less compressibility of brake fluid will increase pedal feel (firmness), but in either case this effect is minimal. The US Army has used silicone brake fluid exclusively since 1982 successfully. Glycols are hygroscopic and will absorb water from the atmosphere, reducing the boiling point of the fluid and degrading hydraulic efficiency. Changing fluid on a regular basis will greatly increase the performance of the brake system, but this is often not a concern in passenger cars. On the other hand, changing fluid at least every several years will preserve the life of brake system components (by removing accumulated water and other contaminants) and increase the overall reliability of the brake system.

Polyethylene glycol and other brake fluid ingredients may be corrosive to paint and finished surfaces such as chrome and thus care should be taken when working with the fluid. In the recent survey, the market of auto industry will expand to its double in the coming years. Auto lubricants have always been the highest demanded product in the past and continue to be in the present as well. The entry of latest innovations and scientific enhancements, the demand of the auto lubricant has climbed the highest peak ever.



The Indian lubricants industry claims to be the sixth largest in the world. It has the presence of almost all major MNCs which include Shell, Mobil, Gulf Oil, Caltex. Some of these oil majors have even tied up or renewed old ties with public sector undertakings, thereby gaining the advantage of distribution and infrastructural networks. The industry is being constrained by high petroleum prices.

Until the 1980s, lubricants produced in the country were basically simple blends based on low and medium level technologies. More sophisticated lubricants were imported and these accounted for a relatively small market.

Product variation is fairly extensive depending on the requirements of the segment served. In many cases, specific customers have their own special requirements.

The lubricants market was dominated by three public sector refinery companies: (i) Bharat Petroleum (ii) Indian Oil Corporation, and (iii) Hindustan Petroleum. Small contributions came in from BPL and private players like Castrol. Lubrizol India and Indian Additives came into existence for manufacturing sophisticated lubricant additives with the collaboration of Lubrizol and Chevron, respectively.

There is a good market potential for this product. Any new entrepreneur venture in this field will be successful.

***Cost Estimation:***

Capacity	:	500 MT/Annum
Plant & Machinery	:	110 Lakhs
Cost of Project	:	404 Lakhs
Rate of Return	:	43%
Break Even Point	:	69%

**Lube Oil Blending Plant  
(Engine Oil, Gear Oil & Grease)**

A lubricant is a substance (often a liquid) introduced between two moving surfaces to reduce the friction between them, improving efficiency and reducing wear. They may also have the function of dissolving or transporting foreign particles and of distributing heat.

Engine Oil is a semi-synthetic high performance lubricant. It is designed for ultimate protection and performance on all naturally aspirated, fuel injected, turbo-charged and multi-valve cars fuelled by gasoline, diesel or LPG.

Multipurpose Gear Oils are used for the lubrication of gears operated under severe conditions, including automotive applications. High quality HVI base stocks blended with a sulfur-phosphorous extreme pressure additive package provide superior performance including anti-weld, anti-scuff, and anti-wear properties.

The function of grease is to remain in contact with and lubricate moving surfaces without leaking out under gravity or centrifugal action, or be squeezed out under pressure. At the same time, grease must be able to flow into the bearing through grease guns and from spot to spot in the lubricated machinery as needed, but must not add significantly to the power required to operate the machine, particularly at start up.

The lubricating oil and grease market in India is of the order of 1.3 million tonnes and is growing at around 4.5% annually. The moderate growth is paradoxically due to the supply of better quality of lubricants which have longer servicing capability.

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The lube market consists of two major segments, automotive and industrial, having a market share of 60% and 40%, respectively. Most of the competition is crowding into the first category. In the automotive segment, while cars and two/three wheelers segment accounts for 30% of the market, diesel operated engines, trucks and other heavy vehicles have the bulk share of 70%.

#### *Cost Estimation:*

Capacity	: 1500 Kls/Annum (Motor oil)
Plant & Capacity	: 34 Lakhs
Total Capital Investment	: 391 Lakhs
Rate of Return	: 47%
Break Even Point	: 31%

#### **Automotive Tyre Plant**

The Indian tyre industry has come of age with the manufacture of almost all types of tyres. The industry has an estimated turnover of close to Rs 100 bn. It is made up of 40 players with an installed capacity of 57.3 million tyres. The industry claims a perceptible export market.

The tyre industry in India has had a long history of over 75 years. Three major multinationals, Firestone, Goodyear and Dunlop, have been operating for a long time. Later came in CEAT. During the 1960s and 1970s the dominance of the MNCs was greatly diluted with the entry of Premier, Inchek and MRF. The Indian presence did not stop there. Several new Indian plants were set up, which included those of Modis, JKs, Raunaq Singh group's Apollo Tyres, TVS group and Vikrant. Firestone was acquired by Modis,

Dunlop by Manu Chhabria group and CEAT by Duncans (later RPG group). Birla Tyres made a late comer's entry into the industry.

The demand of tyres flows from three segments - original equipment (OE), replacements and exports. Of the three, the replacement market is the primary source of demand, followed by the OE segment and exports.

In India, a large & diverse country, conditions under which tyres are used for different purposes constitute an astonishing variety. Climatic conditions are vastly different & instances may be when trucks with some tyres have to travel through arid, wet, hot, cold & snow-covered conditions in various types of terrains. Overloading of trucks, buses or cars much beyond the permitted load bearing capacities of these vehicles is a regular feature.

Hence, in the developing countries like India, where the road conditions are not comparable with developed countries, preference, so far has been towards bias angle, although some radial passenger car tyres have also been introduced in the market. The commercial vehicles users, especially those engaged in conveying goods by trucks, tempos, etc for transporting goods; need to load goods strictly as per loading capacity. Overloading directly affects the life of the tyre.

***Cost Estimation:***

Capacity	:	300000 Tyres Car 200000 Tyres Trucks per annum
Plant & Machinery	:	718 Lakhs
Cost of Project	:	2114 Lakhs
Rate of Return	:	40%
Break Even Point	:	68%

**Peelable Coating for Automobile and Construction Industry**

The construction industry is successfully implementing use of peelable coating. The liquid peelable coating is applied by spray or roller and protects windows in transit, during fitting, resisting mortar and plaster overspray and scratching. It is an easy to apply, strippable coating to protect substrates from scratching and marring during polishing, handling and storage. It can be applied by spinning or dipping and will not leave a residue. It can be a clear or colour water resistant, Protective Coating, peelable temporary protective coating which has many applications. It is air-dries quickly, leaving a tough, yet flexible coating that is easily removed from a variety of surfaces. These are the ultimate in solvent-based removable coating technology. It is stabilized against brittleness and is not softened or penetrated by most water-based compounds.

This economic Peelable coating is also used within the building industry for scratch and stains protection of tiling and other sanitary parts, fittings and stainless steel. There is good scope for new entrepreneurs to enter in to this field.

***Cost Estimation:***

Capacity	:	2000 Kgs./Day
Plant & Machinery	:	65 Lakhs
Total Capital Investment	:	314 Lakhs
Rate of Return	:	47%
Break Even Point	:	37%

**Radial Tyres for Cars & Trucks**

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The tyre industry in India has had a long history of over 75 years. Three major multinationals, Firestone, Goodyear and Dunlop, have been operating for a long time. Later came in CEAT. During the 1960s and 1970s the dominance of the MNCs was greatly diluted with the entry of Premier, Inchek and MRF. The Indian presence did not stop there. Several new Indian plants were set up, which included those of Modis, JKs, Raunag Singh group's Apollo Tyres, TVS group and Vikrant. Firestone was acquired by Modis, Dunlop by Manu Chabbria group and CEAT by Duncans (later RPG group). Birla Tyres made a late comer's entry into the industry.

There is a tremendous growth of automobile industry and a unprecedentedly large number of multi famous brands of cars, trucks and other vehicles coming up. The demand of radial tyres for cars and trucks is increasing at a considerable pace. Tyre varieties can be divided into two categories – cross ply and radial. The domestic industry is dominated by cross ply tyres, due to the poor conditions of roads in the country and overloading of commercial vehicles (CVs). This is also the reason why penetration of radial tyres in the CV segment is negligible and finds presence only in the passenger car segment. Radial tyres can be differentiated on the type of belt used – fiberglass, steel and nylon. Worldwide, steel belted radials are more popular due to their performance advantage. Tyres for car and truck are used in the appropriate vehicle for running the vehicle.

As the vehicles have colossal scope, the scope of radial tyres for cars, trucks etc. are also very bright. While consumers pay a lot of attention to the automobile they are buying – its engine, seating capacity, colour, even the stereos and accessories – little attention is paid to the tyres that carry the weight of the car and its occupants. Consumers will scour the market to find the cheapest tyre and finally may even settle for part-worn or reconditioned rubber. Cars on Indian roads are increasing by the minute and India is slated to have the maximum number of cars on the planet by 2050. With each new car, four new tyres will hit the roads will the tyre industry be able to address not just quality and performance issues.

The industry is currently classified into two broader technology segments: the traditional cross-ply and technically-superior radial technology, especially in the passenger cars segment. The industry had fully absorbed the oldish bias technology. The industry still depends on foreign majors for radial technology but motivated by the export market it has been adopting it rapidly.

JK Tyres pioneered the production of radial tyres in India, which was followed by Ceat, MRF, Dunlop and Apollo. The radial technology has, however, remained mainly confined to passenger car tyres. JK Tyres ventured into the tyres for fast moving mid-sized car segment with its Ultima XPS. It is pitted directly against Bridgestone, which claims a leadership in radials. Efforts are on to radialise the commercial vehicle tyres. The production process and testing requirements of a radial tyre are technologically superior to conventional tyres.

Radials have not made any perceptible dent in the HCV market because of bad road conditions and high level of investment required for this type of tyres. The State Road Transport Corporations, being substantially large buyers of tyres, could be the target to go in for radials. Given the state of the financial performance of these government owned corporations, the use of radial tyres is likely to remain a distant realisation. Radial tyres cost 30% more but result in about 7% fuel saving and give almost double the mileage (80,000 km). All cars launched by foreign auto majors come with radial tyres. However, some perceptible headway in radialisation of tyres in India is noticeable and its usage is estimated at 10% of HCVs, 12% of LCVs, 5% of jeeps and 58% of cars.

It is expected that the demand of radial tyres will increase tremendously. New entrepreneurs can well venture into this field.

***Cost Estimation:***

Capacity	:	300000 Car Tyres 200000 Truck Tyres
Plant & Machinery	:	717 Lakhs
Cost of Project	:	2117 Lakhs
Rate of Return	:	42%
Break Even Point	:	67%

**Automobile Brake Shoes**

The automobile is unique technological achievement which makes the distance shorter. With this a far distance is covered in very short time. Automobile brakes require more attention than any other system in the vehicle. Equal emphasis is given to the clutch but it comes next. The safety of passengers, pedestrians other vehicles and public properties depend upon the design and condition of brake equipments. Brakes must at all time and under varying condition be capable of stopping the vehicle quickly to avoid collisions or loss

of control. In all the leading countries of world regulations requires that vehicles be equipped with breaks that passes definite performance characteristics. In many cases, standards are set by law. In some communities periodic checking or examination are carried out by the highly qualified authority to ensure the highest possible standards of safety.

The total market size of the auto-components industry is estimated at over Rs 700 bn. The overall investment in the components industry is estimated at Rs 288 bn. The sector is composed of 500 medium and large players, besides over 5,000 units in the small scale sector. There are 50 leading companies in the organized sector, which account for a major share of the total output. The number of items produced exceeds 25,000.

Brake shoes are used in the brakes of automobile vehicles. This provides the base to the lining. This is the part which feeds pressure and transmits this force to the lining by expansion. This is a very important part of the braking system. Due to high friction to the vehicle stops.

An immense addition to capacity will thus be taking place in this sector at a time when the domestic car market has slumped. Looking at the ever changing and improving positions of automobile industries it is not difficult to assess that brake shoes industries has a very bright future scope in India. It is but material to conclude that the brake shoes industry has also a similar demand condition. Production of brake shoe depends upon the production of automobile. According to demand, increase of automobile industry brake shoe industry will also increase. Now automobile industry's average growth comes to 4.5%. New entrepreneur may enter in this field with good marketing idea may be successful.

#### *Cost Estimation:*

Capacity	: 4000 Nos./Day
Plant & Machinery	: 48 Lakhs
Total Capital Investment	: 293 Lakhs
Rate of Return	: 55%
Break Even Point	: 39%

#### **Coolant (Automotive) & Grease (Ctb/Axle)**

Most auto engines are cooled by the liquid type. Liquid cooled engines have passages for the liquid, or coolant, through the cylinder block and head. The coolant has to have indirect contact with such engine parts as the combustion chamber, the cylinder walls, and the valve seats and guides. Running through the passages in the engine heats the coolant and going through the radiator cools it. After getting "Cool" again in the radiator, the coolant comes back through the engine. This business continues as long as the engine is running, with the coolant absorbing and removing the engine's heat, and the radiator cooling the coolant.



The basic requirements of the engine coolant are to transfer heat from the internal combustion engine to the radiator, where the fluid is cooled by means of airflow. Further, the coolant needs to provide protection against freezing and boiling all year round.

The function of grease is to remain in contact with and lubricate moving surface without leaking out under gravity or centrifugal action, or be squeezed out under pressure. Its major practical requirement is that it retain its properties under shear at all temperatures that it is subjected to during use. At the same time, grease must be able to flow into the bearing through grease guns and from spot to spot in the lubricated machinery as needed, but must not add significantly to the power required to operate the machine, particularly at startup.

India is the Sixth largest consumer of lubricants in the world. The current lubricants market is estimated to be of \$ 1222 million. Growth is predicted in countries such as China and India where increasing vehicle number will drive demand for the product.

There is good scope for this project.

***Cost Estimation:***

Capacity	:	1500000 Ltrs/Annum Coolant 300000 Kg/Annum Grease
Plant & Machinery	:	70 Lakhs
Cost of Project	:	197 Lakhs
Rate of Return	:	44%
Break Even Point	:	65%

**Rivets (Clutch Facing/Brake Linings)**

A rivet is unthreaded, headed pin used to join two parts by passing the pin through holes in the parts and then forming a second head in the pin on the opposite side. Rivets are widely used for achieving a permanent mechanically fastened joint.

Connection between metal parts is required in most applications, and is a critical part of every design. Rivets require that holes be made to receive them, which reduces that net cross section, and these holes must be very accurately aligned. In a riveted connection there is joining permanently two plate-like members or rolled shape flanges. The connection may be subjected to tension tending to pull the members apart or to shear the members either axially or transversely. The connection may also resist moments, perhaps created by eccentric loads. Torsional, twisting or tearing forces may also be applied. It is essential to determine the forces that act on a connection, both under normal loads and in extraordinary circumstances. A rivet comes as a circular steel rod with a forged head, the manufactured head, on one end. For use, it is placed red-hot into a hole conventionally 1/16" greater in diameter. The length of a rivet is the distance from the underside of the head

to the end of the fresh rivet. The thickness of the material to be joined is the called the grip of the rivet. The length of the rivet to be used for a certain grip is given in tables. The rivet is then set by forging a field head onto it.

Rivets can be used in any orientation; enough clearance must exist to set them properly. A riveted joint is quickly made, and is easy to inspect. For the connection of relatively thin members in steel construction, rivets were traditionally used. Such connections proved very reliable, giving excellent service.

The overall fasteners market is estimated at about Rs. 28 billion, while the organized sector has a share of 65%, the balance of 35% is shared by unorganized sector and imports. The market is heavily dependent on imports which have been growing at close to 28.5% in recent period. There is good future prospect for this industry.

***Cost Estimation:***

Capacity	:	108000 MT/Annum
Plant & Machinery	:	17 Lakhs
Cost of Project	:	78 Million
Rate of Return	:	40%
Break Even Point	:	62%

**Automobile Piston Rings**

The piston is a cylindrical part that reciprocates in an engine cylinder. Piston rings provides a seal between the cylinder wall and piston. A good seal is essential between the piston and cylinder-bore wall to prevent blow-by, i.e. The escape of burnt fuel gases from the combustion chamber, past the piston, which ultimately reaches the crank case. Basically piston ring is a metallic ring made of C.I., wrought iron, steel or gummetal etc. It is generally used as the peripheral part of the piston. Rings offer a stem tight or gas-tight joint between cylinder wall and piston. This arrangement saves leakage of burnt / half burnt fuel mixture and increases pistons efficiency to impart motion. It has very good market demand nowadays, because the Indian automobile industries in India is at present undergoing considerable expansion and modernisation. The prospect of auto-piston industry are highly correlated with the development of automobile industry. So for new investor, it is a fair project for investment.

***Cost Estimation:***

Plant Capacity	:	4000 Nos./Day
Plant & Machinery	:	Rs. 140.05 Lakhs
W. Cap. for 3 Months	:	Rs. 44.41 Lakhs
Total Capital Investment	:	Rs. 248.41 Lakhs
Rate of Return	:	42.37 %
Break Even Point	:	54.94 %

## Chapter 8

## BAKERY & CONFECTIONERY PRODUCTS

### Bakery Unit (Rusk & Cookies)

The term cookies generally prefer a baked product containing a percentage of sugar and fat relative to the flour and a small quantity of water. This general statement on composition separates cookies from bread that contain relatively low level of sugar and fat and intermediate level of water. The type of cookies is defined not only by their composition but also by their method of production. Cookies containing high amount of fats and sugar can be processed by three procedures, like rotary mould, wire cut or bar process. Many types of cookies are manufactured in a baking industry, some of them are mostly preferred the common people. These are like Butter cookie, Almond cookie, bar cookie, Benne cookie, Black & White cookie. Rusk is of two types one of Milk rusk and second is Sooji rusk.

Bakery industry is now almost two centuries old and is producing vast variety of baked products. Outside India more especially in European continent, bakery products are most widely consumed as food items. Cooking habits abroad are relatively simpler and therefore bread consumption is very high.

Biscuits are estimated to enjoy around 37% share by volume and 75% by value of the bakery industry. The organized sector caters to the medium and premium segments, which are relatively less price-sensitive. The organized sector is unable to compete at the lower price range due to the excise advantage enjoyed by the informal sector.

In India, the per capita consumption of biscuits is around 2 kg; compared to more than 10 kg in the US, UK and the West European countries and over 4.25 kg in South East Asian countries like Singapore, Hong Kong, Thailand and Indonesia. China has a per capita consumption of 1.9 kg, while in the case of Japan it is reported at 7.5 kg.

There is very good scope in this sector and new entrepreneurs can venture into this field.

***Cost Estimation:***

Capacity	:	2 MT Rusk/Day 2 MT Cookies/Day
Plant & Machinery	:	110 Lakhs
Total Capital Investment	:	250 Lakhs
Rate of Return	:	49%
Break Even Point	:	41%

**Hard Boiled Candy**

Confectionery products are universally popular among the young and the older generations alike. With increased access to better machinery, openness among customers to newer tastes and flavours and affordability of required raw materials, the confectionery industry is thriving like never before. Candy or Sweet is the most popular type of confectionery over the world, and there is certainly something about this unique product that holds many mysterious qualities. Hard boiled candies are the most common kind of sweets. Generally candies are available in fruit based flavours or Milk based flavour and sometimes with centre filling also. While we often think about candy as a food for children, we all know that adults love this delicious food as well. There are so many flavours available in the market i.e. orange, pineapple, mango, mint, pan, strawberry, grapes etc. and are having good demand among the children.

Hard boiled candy are sugar confectionery which includes hard boiled candies lollipops, mints & lozenges, etc of different flavours. Indians like to celebrate with sweets and they start relishing it at a pretty young age. While the West may be more calorie conscious, the Indian kids start off by indulging in all sorts of sugar boiled candies. No wonder, the confectionery industry is one of the largest and well developed among the food processing sectors in the country.

The organized sector of the Indian confectionery market is estimated to be about Rs 1400 crore and it is estimated that the market is growing at a pace of 9 per cent per annum. The confectionery industry in India is the largest among the food processing industries. It has an annual turnover of around Rs 3,500 crores with huge potential to grow (Including the organized and the non-organized sector). There are four categories of confectionery in the organized sector - chocolate confectionery, sugar confectionery, gum and cereal bars. A large part of the confectionery industry in India comprise of the local subsidiaries of global confectionery majors like Perletti, Lotte, Wrigley's and Cadbury. Korean confectionery company Lotte India.

According to a study by the market intelligence provider Euromonitor, the Indian candy market is currently valued at around \$ 664 million, with about 70 per cent share (\$ 461 million) in sugar confectionery and the remaining 30 per cent (\$ 203 million) in chocolate confectionery. The domestic

confectionery industry is benefitting from the country's economic boom and growth in consumer spending. Indian consumers, with the nation's economy growing at around 10 per cent, are expected to consume more chocolates as the product sells more in happy times. Chewing gums and sugar-free products are emerging categories, which are showing high growth. However, considering the huge unorganized segment hard boiled confectionery will continue to be the largest contributor.

There is a very good scope and ample space for new entrepreneurs to venture into this field.

***Cost Estimation:***

Capacity	:	360 MT/Annum 150 Kgs./Hr or 30 MT/Month
Plant & Machinery	:	40 Lakhs
Total Capital Investment	:	188 Lakhs
Rate of Return	:	45%
Break Even Point	:	47%

**Chewing Gum**

Sweetened gum used for chewing is a product made from gum and similar resilient substances. It appears in many forms and is chewed for its multi-flavoured taste. Chewing gum is originally made of the prime raw material called 'chicle gum' which was imported. Sugar and flavouring agents were added to make the chew more palatable. With the increase in demand for these products and the short supply of chicle gum considerable research were under taken and several substitute of natural and synthetic gum were developed in the country.

Chewing gum is a sweetened, flavoured confection composed primarily of latex, both natural and artificial. Organic latex, a milky white fluid produced by a variety of seed plants, is best known as the principle component of rubber. Used as a snack, gum has no nutritive value and when people have finished chewing, they generally throw it away rather than swallow it. Chewing gum is offered to consumers in several forms. Candy coated in rectangular or ball shape, stick or slab gum bubble gum in toffee shape is some of the varieties common in the Indian market.

All recipes for chewing gum manufactured today share the same main ingredients: a gum base, sweeteners, primarily sugar and corn syrup, and flavourings. Some also contain softeners, such as glycerine and vegetable oil. The amount of each added to the mix varies as to which type of gum is being manufactured. For example, bubble gum contains more of the gum base, so that bubbles don't burst while blowing. Though gum manufacturers carefully guard their recipes, they all share the same basic process to reach the finished product.

The global confectionery market comes under packaged food industry and is the fourth largest segment under packaged food. It is also the fastest growing segment of the packaged food industry. Confectionery is further segmented into chocolate confectionery, sugar confectionery and gum. Of the three segments, gum has the lowest share. Chewing gum is also the most concentrated market of the three segments.

The chewing gum segment, the fastest growing segment of confectionery industry is growing at a CAGR of approximately 7% for past few years due to mouthful of benefits. It is said to relieve stress, helps in weight management, increases alertness and focus. All these factors result in the increasing demand of chewing gum in people of every age group.

Innovation in chewing gum is another important driver of this industry. Different flavours, flexibility and variety in gum attract the consumers and the current trends suggest consumers prefer gum with natural colours and avoid usage of synthetic and azo colours.

The chewing gum category in India is growing at a healthy 20%. According to AC Nielsen, the size of India's total gum category is around Rs 1,000 crore. Chewing gums and bubble gums account for approximately 44% and 56% of the category respectively. In India the bubble gum segment is larger than the chewing gum segment, whereas in the rest of the world it is the other way round, Wrigley is a leader in both the bubble gum and the sugar-free chewing gum. Chewing gums and mints are a global phenomenon with the new generation. Product quality and effective marketing - which includes brand equity, have been instrumental in the market surge.

There is a good scope for new entrepreneurs to venture into this field.

#### ***Cost Estimation:***

Capacity	: 750 MT/Annum
Plant and Machinery	: 50 Lakhs
Total Capital Investment	: 228 Lakhs
Rate of Return	: 47%
Break Even Point	: 42%

#### **Chocolate & Confectionery**

Chocolate is a key ingredient in many foods such as milk shakes, candy bars, cookies and cereals. It is ranked as one of the most favourite flavours. The chocolate and confectionery products industry has traditionally been subject to significant fluctuations in demand chocolate products tend to be seasonal in nature, with demand increasing sharply during the holidays. Consumers of all age groups prefer chocolate and confectionery products because of their attractive appearance and colour. Now-a-days varieties of products have gained importance due to their delicious taste & better keeping quality.



Chocolate, candy and gum are some of people's best loved treats. These sweets have been enjoyed around the world for thousands of years. Chocolates are not high in cholesterol. People consistently name chocolate as their favourite flavor for desserts and sweet snacks. Chocolates are the favourite item of children.

Confectionery category includes products such as chocolate, gum, sugar confectionery, gummies/jellies, hard candy, toffee and fudge. The main reasons for purchasing are convenience, passive health, age, choice and pleasure. The most popular flavour groups are brown flavours, fruit, nuts, mints & menthols & dairy flavours. The top 5 companies supplying confectionery are Cadbury, Nestle, Kraft, Lindt & Mars.

The organized sector of the Indian confectionery market is estimated to be about Rs. 1400 crore and it is estimated that the market is growing at a pace of 9 percent per annum. The confectionery industry in India is the largest among the food processing industries. It has an annual turnover of around Rs. 3500 crores with huge potential to grow. The Indian chocolate market is estimated at US \$ 400 million and growing at 18 percent per annum. Cadbury has over 70 percent share in this market.

So, the demand of chocolate & confectionery are increasing day by day. There is very good domestic as well as export market for chocolate & confectionery. New entrepreneurs can well venture into this field.

***Cost Estimation:***

Capacity	:	150 MT Chocolate/Annum 150 MT Toffee/Annum 150 MT Candy/Annum
Plant & Machinery	:	137 Lakhs
Cost of Project	:	278 Lakhs
Rate of Return	:	43%
Break Even Point	:	51%

**Biscuit Plant**

Biscuits are one of the important bakery items and can be used whole day irrespective of time. It is very common for morning breakfast and also used as snacks. Biscuits are generally classified into soft biscuits, hard biscuits and crackers. Biscuit dough are made mainly from flour, fat, sugar and water, with minor amounts of flavor, colours, and aerating agents and possibly eggs and fruits. Around the world Biscuits is the principal food and provides more nutrients than any other single food source. The value of grain in the world used for human consumption is over 2-3 times of the value of the world iron and steel production. Although only 14% of the grain in the world is handled through international channels, cereal grains make up more than half of all the goods in overseas trade.

### **Properties of Raw Materials**

**FLOUR:** The main ingredient in Biscuit making is wheat flour. Mixing the dough not only disperses the ingredients but also develops the gluten strands to proper strength and elasticity that retain, numerous small gas cells arising from fermentation. During fermentation, the dough which is originally tough and elastic, mellers and becomes more extensible so that it can be machined more easily and baked into food of good volume. The quality of flour depends on the initial quality of wheat.

**SUGAR:** Sugar is used in Biscuit production as a contributor to crust colour through browning and caramelization reaction. Corn syrups, both regular and high fructoses are the predominant sweeteners of the biscuit industry, sucrose, and dextrose is also used single or combination with syrup. Sucrose is most widely used as sweetening agent.

**SHORTENING:** Animal and vegetable fats and oils are used in balled foods to produce tenderness and are designed to impart particular qualities so the finished product. Generally, other shortening are used in Combination with butter to reduce cost. The average amount of shortening in Biscuit is 38 Kg per 100 Kg flour.

**MILK AND MILK SUBSTITUTE:** Milk must be specially treated with High heat, which has been subjected to high temperature. Egg whites are used to make white angel food cakes.

**SALT:** The components of dough and butters are dispersed in water unless mild fluid products are used.

### **Manufacturing Process**

**MIXING:** This is a process where all ingredients are put together in right proportion for dough formation. These ingredients are then fed into Mixers where mixing is done and dough is prepared for moulding .Major ingredients are flour, fat, sugar and others as per the product one would like to have.

**MOULDING:** In this section we laminate the dough into sheet which then passes down to gauge rollers and sheet thickness achieved for cutting. Here we have a cutter or moulder as per the variety where one gets the shape and sizes of biscuits.

**BAKING:** This is the area where we pass these moulded wet biscuit into baking oven .The biscuits are baked on desired temperatures. Various type of heating are available now days as per the convenience and cost .Different type ovens are available.

**COOLING:** These baked biscuits are then passed on to cooling conveyors for natural cooling prior to packing .The temperatures are brought down to room temperatures.

**PACKING:** These biscuit are then stacked and fed into packing machine for packing. Different packing materials are available for packing of these biscuit in different packs. Slug packs, pouch pack or family packs etc. These packs are then put into secondary packaging like cartons to be transported to retailers.

**Equipment used for Automated Biscuit Manufacturing:** Mixers, Laminators, Gauge Rolls or Pre Sheeters, Moulder / Cutter, Baking Oven, Cooling Conveyor, Packing Machines, Material Handling Equipments, Biscuit / Sugar Grinder, Milk/Oil Sprays and Salt / Cashew Sprinklers.

**Ingredients used:** Flour, Fat, Sugar, Salt, Ammonium bicarbonate, Milk, Butter, Flavours, Emulsifiers, Invert syrups, Dough Improvers and many additives

The biscuits are used as breakfast, as snacks. These are widely consumed by Army. The children eat biscuits with interest. The old age man also eats digestive biscuit. The other occasion of the consumption of biscuit is party, functions, meetings etc.

### **Indian Scenario**

India Biscuits Industry is the largest among all the food industries and has a turnover of around Rs.3000 crores. India is known to be the second largest manufacturer of biscuits, the first being USA. It is classified under two sectors: organized and unorganized. Bread and biscuits are the major part of the bakery industry and covers around 80 percent of the total bakery products in India. Biscuit stands at a higher value and production level than bread. This belongs to the unorganized sector of the bakery Industry and covers over 70% of the total production. Indian biscuit industry has occupied around 55-60 percent of the entire bakery production.

#### ***Cost Estimation:***

Capacity	: 10500 MT/Annum
Plant and Machinery	: 579 Lakhs
Cost of project	: 1851 Lakhs
Rate of return	: 44%
Break Even Point	: 35%

### Banana Powder

Banana powder is a powder made from processed bananas. Banana is one of the most abundant fruit crops in India. It is also one of the sources of income for farmers. Banana powder has a great potential for commercialization. It has a high sugar and low starch content and can be used as a substitute for fresh banana in making traditional cakes or their premixes as well as in the processing of banana snacks, crackers or crisps. The quality of banana powder is determined by the colour, flavour, texture and moisture content. These are affected by the varieties of bananas and processing operations specially blanching process. Good quality powder is produced from the bananas of right variety and degree of ripeness. The dry powder can be used as an additive in confectioneries, milkshakes and baby foods. Banana powder, because of its high concentration of banana essence, has been found to be a major source of carbohydrate and calories. While it is generally low as a source of protein, the beneficial ingredients of the powder are still "markedly superior to that of other fruits".

### Applications

- ★ The powder has been found to be useful as a general treatment for dyspepsia (indigestion).
- ★ Fights Anemia by stimulating the production of hemoglobin.
- ★ Helping regulate blood pressure because of high potassium and low salt levels
- ★ Reducing constipation because of high amounts of fiber, assisting learning & alertness by bringing more oxygen to the brain
- ★ A banana powder has a mild laxative property and hence is very useful in children's diseases
- ★ Banana powder is helpful to combat diarrhea and dysentery
- ★ Used for the treatment of stomach ulcers.

- ★ Banana powder with milk and sugar can be an excellent supplementary or weaning food for children, it is used in the diets of children for treating malnutrition
- ★ Experiments have shown that intake of banana powder helps children to retain many mineral nutrients.

### National Scenario

India is the fruit and vegetable basket of the world. India produces 54% of world's mango, 23% banana, 24% cashew nuts, 36% green peas and 10% onion production. India is the largest producer of banana in the world. Maharashtra accounts for 25% of banana production in India, followed by Tamil Nadu (20%), Gujarat (15%), Karnataka (10%) and Andhra Pradesh (10%). The major banana producing states of India are Tamil Nadu, Maharashtra, Karnataka, Gujarat, Andhra Pradesh, Assam and Madhya Pradesh. In India, Banana is available all through the year all over the country. If it is converted into powder or other form with the help of technology, then not only a massive wastage of this fruit could be prevented but more demand for the fruit could also be generated, because demand for individual products can be increased if they are offered before or after the season.

### International Scenario

Bananas are the 10th largest agricultural commodity in world trade after cereals, sugar, coffee and cocoa. India, Ecuador, Brazil and China alone produce half of total bananas of the world. The advantage of this fruit is its availability round the year. The present scenario the productivity of World is 115.20 T/ha where as that of India is 30.63 T/ha. Banana powder and pulp is largely used in the baking and confectionery, and baby food industries. The Indian food industry is estimated to be worth over US\$ 200 billion and is expected to grow to US\$ 310 billion. By 2015 India is one of the world's major food producers but accounts for only 1.7 per cent (valued at US\$ 7.5 billion) of world trade in this sector – this share is slated to increase to 3 per cent (US\$ 20 billion) by 2015. Since the applications and demand of banana powder is immense therefore the potential of the product is excellent. It is one of the imperative fields to endeavour.

### *Cost Estimation:*

Capacity	:	4500 MT/Annum
Plant and Machinery	:	166 Lakhs
Cost of project	:	539 Lakhs
Rate of return	:	43%
BEP	:	64%

### **Banana Chips**

Snack foods have become very popular among all age groups in India and its popularity is growing day by day. A variety of snack foods are presently available at reasonable prices but banana chips have gained popularity during the past years. Banana Chips are a popular snack eaten world over. It is high in saturated fat content. They are a tropical snack. These are hot, salty, crunchy fried plantain chips. It is served as part of a traditional meal in South India. It is very popular in many countries in the tropical belt. It is an alternative to potato and corn chips. Banana (*Musa* sp.) is the second most important fruit crop in India next to mango. Its year round availability, affordability, varieties range, taste, nutritive and medicinal value makes it the favourite fruit among all classes of people. It has also good export potential. They have great potential for growth due to their immense popularity and nutritional aspects.

There are two different methods for making banana chips. One of these is to deep fry thin slices of banana in hot oil, in the same way as potato chips or crisps. The other is to dry slices of banana, either in the sun or using a solar or artificial dryer. The products made by the two methods are quite different. The deep fried chips tend to be a savoury, high calorie product that is eaten as a snack food. Because they are deep fried in oil they have a fairly short shelf life- up to 2 months maximum when stored in the correct conditions. The oil is prone to turning rancid and the crisps to becoming soft if they are not stored in air-tight containers.

The overall size of the snack food market is estimated at Rs. 45 to Rs. 50 billion. The market is reported to be growing at 7 to 8 % annually. Chips are estimated to constitute nearly 85% of India's total salty snack food market of about Rs 2,500 crore.

About 90% of banana produced is consumed domestically as fresh fruit. Merely 5% is consumed in processed form providing a good potential for future processing. About 2.5% is only processed purely as banana products and the rest as an ingredient in other foods. About 17 varieties of products could be made from banana. The primary product of banana in market is "fried chips and candy" which constitute around 31%, rest as banana puree 9%, banana pulp 3%, banana beer 3%, banana chips 3%, banana powder 6% and others. There is a good market demand of all banana products.

There is a very good scope for this product and new entrepreneurs should venture into this field.

#### ***Cost Estimation:***

Capacity	: 30000 Kgs/Annum
Plant & Machinery	: 5 Lakhs
Total Capital Investment	: 14 Lakhs
Rate of Return	: 51%
Break Even Point	: 53%



## Chapter 10

## BIOTECHNOLOGY

### **Biopesticides (Trichoderma Harzianum, Pseudomonas Fluorescens, Beauveria Bassiana)**

Biopesticides or natural pesticides are reduced-risk products derived or developed from biological or naturally derived chemistry. Biopesticides offer value to users by providing a combination of both effective performance and product safety. Most people think biopesticides are only for organic production but they are very good tools for organics, but more than 80 percent of the biopesticides are used in conventional agriculture, rotated and tank-mixed just like any other product.

Trichoderma is a fungus which is present in nearly all soils and other diverse habitats. They attack and parasitize other fungi. So far, Trichoderma has been successful in controlling every plant – pathogenic fungus against which it has been used.

Pseudomonas fluorescence is a bacteria that is used as a pesticide for controlling many kinds of fungus, virus & bacterial diseases. Residues of the bacteria are not expected to remain on treated food or feed. Available information indicates that use of pseudomonas fluorescence as a pesticide is not expected to adversely affect people or the environment.

Beauveria bassiana is a naturally occurring fungus in soils throughout the world. It is most effective against lepidopteron Caterpillar Pest of Vegetables and fruit plants and sucking pests like mites and spiders of vegetables and flowers, Colorado beetle of potato. It is also highly effective against rice hispa.

The Indian industry has been focusing sharply on integrated crop management (ICM), increasing exports of genuine pesticides and concentrating on farmer friendly activities. The pesticide industry is targeting a 10% share of global pesticides market and has been working on the ICM programme to introduce safer applications, spray devices and crop protection through balanced use of biological and chemical pesticides. The exports cover pesticide

intermediates. Pesticides export from India was growing at the rate of 15% and is expected to witness a more accelerated growth.

In India Market Prospects for biopesticides are good. Consumption of biopesticides is increasing day by day. Most of the biopesticides find use in public health, except a few that are used in agriculture. 85% of the biopesticides used are neem based products. Improvements in primary production are a first step to achieve higher safety in the long run.

So, there is wide scope for new entrepreneurs to venture into this project.

#### ***Cost Estimation:***

Capacity	:	100 MT/Annum 50 MT/Annum (Trichodarma) 30 MT/Annum (Pseudomonas) 20 MT/Annum (Beauveria)
Plant & Machinery	:	78 Lakhs
Cost of Project	:	413 Lakhs
Rate of Return	:	41%
Break Even Point	:	60%

#### **Enzymes**

Biotechnology, with its knowledge-intensive nature and tremendous economic potential, has emerged as one of the rapidly-growing sectors of the Indian knowledge economy today. Focusing on the practical use of biological systems to produce goods and services, biotechnology has made significant achievements in the growth and its application in the areas of agriculture, healthcare, environment, etc through R & D projects and infrastructure creation.

The word "Enzyme" brings to mind the enzymes studied in biology like trypsin and insulin. However, as is common knowledge, the use of enzymes is not only restricted to biological systems but they are also use widely in the industry. Enzymes are ideal catalysts—they are highly selective in nature and work under mild conditions. Presently more than 2000 different enzyme activities have been isolated and characterized. The sequence information of a growing number of organisms opens the possibility to characterize all the enzymes of an organism on a genomic level.

The food processing industry is highly dependent on enzymes. During processing of food, enzymes are added to elaborate a wide range of effects. One such important effect is to modify biopolymers to obtain the desired end product. Further, the action of enzymes on foodstuffs facilitates in improving digestibility, palatability and attractiveness besides enhancing nutritive value of the food.

Enzyme technology is presently going through metamorphosis. It is the development of the theory concerning enzyme function and how the structural entity of various domains of a protein are revealed to its catalytic activities.

There are some industries in pharmaceutical and bulk drugs industries produces enzymes for its own utilization.

There is some manufacturers produce enzymes and satisfied partial India's demand but there is more than 30% of enzymes are imported especially alkaline proteases, pectinase B-amylase, and some special type of enzymes.

An analysis of the market for enzymes from fermentation sources were estimated to account for about 80% of the total. Most of the non-fermentation sales were accounted for by calf rennet, barley B-amylase, pancreatic proteinase, and small-volume pharmaceutical and analytical enzymes. The largest single enzyme market was for bacterial alkaline proteinases in detergents. Microbial proteinases accounted for 40% of the total market and glycosidases for about 20% so that hydrolytic enzymes dominated the market. Glucose isomerase commanded the largest non-hydrolase sales at 6% of the total market.

The Industrial enzyme market is growing steadily as most of the enzymes are produced by microorganisms in submerged cultures going by the biotechnology technique. Growing consumption of enzymes in the existing application areas, use of enzymes in the new industrial processes, strict enforcement of environment laws and cost savings were some of key drivers for the growth of this sector in India.

There is a very good scope in this field and new entrepreneurs should venture into this sector.

***Cost Estimation:***

Capacity	:	1500 MT Amylase/Annum 1500 MT Proteases/Annum
Plant & Machinery	:	601 Lakhs
Cost of Project	:	1118 Lakhs
Rate of Return	:	45%
Break Even Point	:	50%

## Chapter 11

### CEREAL PROCESSING (RICE, DALL (PULSES), WHEAT)

#### Rice Flake (Poha)

Rice flake is the husked rice which is flattened into flat light dry flakes. These flakes of rice swell when added to liquid, whether hot or cold, as they absorb water, milk or any other liquids. The thicknesses of these flakes vary between almost translucently thin (the more expensive varieties) to nearly four times thicker than a normal rice grain. These are also known as POHA. Poha industry comprises an important segment of Industrial activity in food processing industry in the country. It provides nutrition breakfast and food to a large number of households in cities, towns and even villages of India. Poha industry has also an important role in popularizing wheat in traditionally non wheat consuming regions of the country. Poha consumed by people of all ages and all times. With tea and coffee, Poha make a tasty and nutrition snack. There is a definite need for the poha industry to make inroads in the rural areas.

#### Applications

It is a vegetable food. All the men and women eat poha in the breakfast and children like it. It has light in weight so it cannot be harmful in any stage. The urgency for the development of nutritionally balanced protein foods, which would be within the reach of a substantial portion of the population in a country like India, can hardly be over emphasized. The dietary deficiencies of protein, particularly among pre-school children and also during the prenatal period, can lead to both physical and mental impairment.

#### Global Demand

A typical, average middle class Indian family did not have a standard breakfast on a regular basis like its Western counterpart. Those who did have breakfast consumed milk, snacks, bread, butter, jam or local food preparations like dalia idlies, parathas and the like as convenient. As a result of the organized efforts of domestic and global players, the breakfast items have come now to include cereals, energy bars, fresh dairy products and fruit juices. Because

of these forays, the breakfast cereal category almost doubled between 2003 and 2006. Estimated at a modest Rs 2.5 billion, the market includes cornflakes, muesli, pancakes, oatmeal and porridge. It is growing fast not only because of macro factors, such as acceptance of packaged food and rising household incomes but also because companies have become innovative. The market is estimated to be growing annually up to 30%, and with modern retail providing new recipes of the contemporary products, Indian and Western, a strong wave of growth is anticipated.

The demand of Rice flake in the market is immense and therefore its market position is splendid. Hence it is an excellent field to venture.

***Cost Estimation:***

Capacity	: 4MT/day
Plant and Machinery	: 26 Lakhs
Total capital investment	: 146 Lakhs
Rate of return	: 43%
Break Even Point	: 44%

**Wheat Flour Mill**

Wheat is a grass, originally from the Fertile Crescent regions, but now cultivated worldwide. In 2007 world production of wheat was 607 million tons working it the third most produced cereal after maize (784 million tons) and rice (651 million tons). Globally, wheat is the leading source of vegetable protein in human food having higher protein content than either maize (corn) or rice, the other major cereals. In terms of total production tonnage used for food it is currently second to rice as the main human food crop and ahead of maize after allowing for maize's more extensive use in animal feeds.

Wheat is planted to limited extent as a forage crop for livestock, and its straw can be used as a construction material for roofing thatch. The whole grain can be milled to leave just the endosperm for white flour.

The products of this are bran and germ. The whole grain is a concentrated source of vitamins, minerals, and protein while the refined grain is mostly starch 100 grams of protein 1.5 grams of total fat, 71 grams of carbohydrate, 12.2 grams of dietary fiber and 3.2 mg iron the same weight of hard red spring.

Wheat contains about 15.4 grams of protein, 1.9 grams of total fat 68 grams of carbohydrate (by difference) 12.2 grams of dietary fiber and 3.6 mg of iron.

Wheat flour is a powder made from the grinding of wheat used for human consumption. More wheat flour is produced than any other flour. Wheat varieties are called "clean" "white" or "brown" if they have high gluten content and they are called soft or weak, Flour if gluten content is low.



The most common physical and chemical tests used to determine wheat quality. The wheat and flour tests are standardized testing procedures commonly used for quality control purpose.

A wheat flour milling process for producing whole grain wheat flour which has the full nutritional value of wheat kernels While retaining the texture of refined wheat flour and an appearance similar to refined wheat flour and the products which can be made from the grain wheat flour.

There is a very good scope in this sector and new entrepreneurs should venture into this field.

***Cost Estimation:***

Capacity	:	30000 MT/Annum
Plant and Machinery	:	240 Lakhs
Cost of Project	:	736 Lakhs
Rate of Return	:	41%
Break Even Point	:	63%

**Atta Chakki Plant**

INDIA is one of the world's largest food producers, yet branded foods account for an inconsequential proportion. Among the various food industry segments, the largest is wheat. Estimates of the industry's size vary, but it is generally put at around Rs. 80,000 crores. This estimate may be far off the mark, but there is no disputing the Indian market's vastness for mass consumption items such as wheat products.

Considering the industry's size and low brand penetration, international giants have set their sights on the nascent Indian market for branded wheat products biscuits, breads, packaged atta and innovations such as chapattis.

The domestic branded atta market is currently growing by around 25 per cent annually. The packaged and branded segment is largely dominated by multinationals, although there are also a few big domestic brands such as Shaktibhog and Rose.

Atta is one of the staple and basic foods not for only Indians but for all lives in the world. The protein content of wheat differs according to variety of wheat. Some Canadian wheat contains high protein while English wheat contains low quantity. The demand growth of atta is increasing day by day in 5 to 10 Kgs. Packs.

Having view in demand growth of atta, there is very good scope for setting up an atta chakki plant.



***Cost Estimation:***

Capacity	:	4500 MT/Annum Whole Wheat Flour (Atta)
Plant & Machinery	:	16 Lakhs
Total Capital Investment	:	245 Lakhs
Rate of Return	:	48%
Break Even Point	:	35%

**Roller Flour Mill (Atta, Maida & Suzi)**

Roller Flour mill serve the purpose of processing wheat to convert it into flour. The plant will have facility to produce, maida, suzi, atta and bran. These products will be sold as per the guidance issued for Food and Civil Supplies Department of the concerned state. Thus milling is an imperative physical function involved in converting wheat into its milled products that is separating the wheat grain into its constituents (bran, germ and endosperm).

Wheat grains are the seed of the wheat plant, which is able to grow in kinds of soil and under widely differing climatic conditions. The principle wheat of commerce belong to the botanical groups *Triticum vulgane*, *Triticum durum* and *triticum compactum*. A grain of wheat is avoided in shape and it bears at one end a number of short fine Grains.

The grains of wheat consists of three main parts the enveloping skins, the embryo and the endosperm. The relative proportions of these parts vary with the plumpness of the grain but the average composition of wheat is 83% endosperm, 2.5% embryo and 14.5% enveloping skins. The enveloping skins are pericarp consists of the epidermis, epicarp and endocarp. The pericarp represents about 6% of the grain. The seed coat consists of the testa, the hyaline layer which comprises about 2% of the grain. The aleurone layer representing about 6.5% of the grain wheat show a wide range of analytical data which is not unexpected in view of the many varieties which are grown and the very different conditions under which they are cultivated.

Flourmill consists of following machineries as blender, sieves, breaks rolls, smooth steel reduction, rolls aspirators, conveyors water washers etc. The RFM industry is basically agro-based processing industry engaged in the manufacture of products based on wheat, namely maida, sooji, atta and bran. In some states, under special arrangements RFM units produce whole meal atta to meet the requirements of various distribution programmes. Apart from direct consumption by general consumers, maida and sooji produced by RFM units serve as the most important raw material to more than 55 thousand units manufacturing bread, biscuit and bakery products all over the country. Besides this the resultant wheat bran serves as the poultry feed.

***Cost Estimation:***

Capacity	: 15000 MT/Annum
Plant & Machinery	: 109 Lakhs
Total Capital Investment	: 748 Lakhs
Rate of Return	: 46%
Break Even Point	: 32%

**Integrated Unit**

**(For Rice Mill, Rice Bran Oil Extraction with Captive Power Plant)**

The economics of rice milling industry is largely dependent on the useful commercial utilization of its by-products. The purpose of Integrated Unit is to ensure the total utilization of all the resources or by-products available at disposal from the rice milling process are used efficiently and effectively. The by-products such as rice bran will be used for extraction of rice bran oil; the rice husk will be used for effective cogeneration of electricity and steam/heat for in-house consumption. The project activity is helping in conservation of natural resources like coal and HSD and above all efficient waste disposal management.

Over the last decade and half, India Inc has established itself as a vibrant economy with growing domestic consumption coupled with huge export potential. Stable political environment, dependable democratic fabric of the country, strong legal system, huge talent pool and cost advantage have made India a reliable business partner of the global community, attracting good foreign investment. While the growth trend is set off, there is tremendous need for building the background infrastructural support system to sustain the trend.

Rice is the staple food for 65% of the population in India, India has the largest area under paddy in the world and ranks second in the production after China. Country has also emerged as a major rice consumer. Rice is the largest consumed calorie source among the food grains. Rice bran and rice husk are the by-products of the rice milling process. Rice bran is the most important source of edible oil among the unconventional sources. Rice husk, considered as an agricultural waste is a proven clean and efficient biomass fuel which can replace conventional fossil fuel uses.

Power being one of the most crucial needs for industrial growth finds its priority and as a result the National Electricity Policy rightly envisages "Power for all by 2012". To attain this target, a total capacity addition of about 100,000 MW was projected for 10<sup>th</sup> and 11<sup>th</sup> plan period. Although there has been some hectic activity in capacity addition, the possibility of attaining the target looks remote. This increases the responsibility of each industry so as to become self-reliant in power, not only to ensure reduced operational expenses but also to contribute towards making the country self-sufficient in power.

There is a very good scope with ample of space for new entrepreneurs to venture into this field.

***Cost Estimation:***

Capacity	:	Rice 106029 MT/Annum Broken Rice 8389 MT/Annum Rice Bran Oil 2573 MT/Annum Deciled Rice Bran Oil 13486 MT/Annum Power Distribution 15750 MWh/Annum
Plant & Machinery	:	4373 Lakhs
Cost of Project	:	8016 Lakhs
Rate of Return	:	36%
Break Even Point	:	40%

**Dall (Pulses) Mill**

Pulses are the most common diet part of Indian families and are the main sources of proteins. The important parts of pulses play as a source of dietary protein, energy, minerals and vitamins for the predominantly vegetarian population of India, needs no reiteration and nutritionists regard pulses as an essential means to correct malnutrition. Even in the developed countries, the trend has been in flavour of substituting animal protein by vegetable protein in view of the indications about the positive correlation of arterio-sclerosis with diets rich in saturated fatty acids, on the one hand, and decreases in blood cholesterol level with the inclusion of pulses, on the other. Pulses not only have nutritional value for human beings, but also contribute to soil fertility, besides providing nutritious green fodder and feed for livestock.

The important dalls in the country are Channa Moong, Urad, Moth, tur dall and Masoor, Matar etc. The pulses are used for preparing hot dishes, sweet dishes and other varieties. There are over 1000 units at present engaged in processing of various pulses in different parts of the country, but most these mills are based on absolute type technology resulting invariably in high production losses. The pulse milling industry is predominantly a small-scale industry and has been reserved for exclusive development in small-scale sector.

The inter-dependence of agriculture and industry is related both to the management of inputs and the processing of the produce. The highest priority therefore, must be given to industrial investment, which is agro-based so that growth in both the sectors can be accelerated on a mutually supportive basis.

A pulse grain is made of two parts covered under a continuous encloser called husk or peels. Cleanly removing the peels and splitting the pulse grains in fact two pieces is the most desired form of dall to be cooked for the families. Pulse mills can satisfy the tastes of consumers by providing unbroken

natural full parts of the pulse grains with no husk part left behind on the pulse being supplied to the consumer. Further, besan of very fine and clean type can be easily offered to the consumers by using the up to date technology of pulse mills. Losses can be minimized and pulse prices can be contained within the reach of general mass by technological improvements and large-scale production in our dal mills without an extra expense on the part of pulses millers.

The area under pulses has been around 20 to 24 million hectares, the production around 10 to 13 million tonnes and the productivity around 475 to 544 kg per hectare. Over a dozen pulses crops are grown and gram (chickpea) and arhar (pigeonpea) account for 45 per cent of the total pulses output. The other important pulses crops are: moong, urad, cowpea, mothbean, lentil, horsegram and lathyrus (kesari dal).

The major pulses - growing States are Madhya Pradesh, Rajasthan, Uttar Pradesh, Maharashtra, Orissa, Bihar, Andhra Pradesh, Haryana, Tamil Nadu, West Bengal, Punjab and Gujarat. The other State has only a limited area under pulses.

India's pulse exports have reached 50,000 tonnes annually. Farmers get a good return by exporting quality chana, urad, toovar, and moong to foreign market like Dubai, US, Canada, and Britain. Imports are much more widely spread out, with Spain and India leading the importing nations. India is the leading import market for food pulses, while Spain's main import is feed peas.

***Cost Estimation:***

Capacity	:	100 MT/Day (Channa, Moong, Urad, Toor & Yellow Pea Dal)
Plant & Machinery	:	82 Lakhs
Cost of Project	:	502 Lakhs
Rate of Return	:	55%
Break Even Point	:	49%

**Kuttu (Buckwheat) Seed Dehulling**

Kuttu or Buckwheat or beech wheat gets its name from its triangular seeds, which resemble the much larger seeds of the beech nut, and the fact that it is used like wheat is a non-glutinous pseudo-cereal. It is similar to sunflower seed, with a single white seed inside a hard dark brown/black outer hull.

Buckwheat is commonly grown for its black or gray triangular seeds. It can also be grown as a green manure crop, a companion crop, a cover crop, a source of buckwheat honey, and as a pharmaceutical plant yielding rutin. There are three known species of buckwheat: common buckwheat, *Fagopyrum esculentum* Moench; tartary buckwheat, *F. tartaricum* Gaertn; and perennial buckwheat, *F. cymosum* L. common buckwheat, also known as *F. sagittatum* Gilib, is by far the most economically important species, accounting for over

90% of the world buckwheat production. Buckwheat is cultivated throughout the world as a subsidiary food crop, buckwheat has been a crop of secondary importance in many countries and yet it has persisted through centuries of civilization and enters into the agriculture of nearly every country where cereals are cultivated.

Buckwheat grain is grown mainly for human consumption and as animal feed, although it can also be used as a vegetable, a green manure crop, as a smother crop to crowd out weeds and as a source of buckwheat honey.

Demand for buckwheat grain is solid and steadily improving. The primary demand has come from the export market, but even in the India, U.S. buckwheat use has risen, in part due to multi-grain baked foods. In India the cultivation has been restricted to the cool, moist and temperate regions of Jammu & Kashmir, H.P., U.P., interior parts of the Himalayas ranging to an altitude of 700 to 3000 m and in some Southern States. It is a short term important Crop which can be grown in all types of soil and takes a total of 60-70 days to mature. It occupies about 90% of cultivated lands in the higher Himalayas with a solid stand.

There is good export as well as domestic demand. New entrepreneur enter in this project will be successful.

***Cost Estimation:***

Capacity	:	9000 MT/Annum Dehulling Kuttu Seed (Buckwheat)
Plant & Machinery	:	194 Lakhs
Total Capital Investment	:	763 Lakhs
Rate of Return	:	43%
Break Even Point	:	36%

## *Information*

- ★ One Lac / Lakh / Lakhs is equivalent to one hundred thousand (100,000)
- ★ One Crore is equivalent to Ten Million (10,000,000)
- ★ T.C.I. is Total Capital Investment
- ★ All costs/amount given in INR ₹
- ★ NPCS can provide customized Detailed Project Report on all the projects
- ★ Visit us at: [www.niir.org](http://www.niir.org) Email : [info@niir.org](mailto:info@niir.org)

### Precipitated Calcium Carbonate

Precipitated Calcium Carbonate (PCC)—also known as purified, refined or synthetic calcium carbonate. It has the same chemical formula as other types of calcium carbonate, such as limestone, marble and chalk:  $\text{CaCO}_3$ . The calcium, carbon and oxygen atoms can arrange themselves in three different ways, to form three different calcium carbonate minerals. The most common arrangement for both precipitated and ground calcium carbonates is the hexagonal form known as calcite. Calcium carbonates, including PCC, are considered to be non-toxic. As long as the PCC meets certain purity requirements, it can be used as a direct food additive, as a pharmaceutical or as an indirect additive in paper products that come in contact with food. Similar acceptances and approvals exist around the world where PCCs are widely used in these applications. PCC is purer than the limestone from which it is made, and is lower in silica and lead.

### Application

Precipitated calcium carbonate is a versatile additive for use in a wide range of plastic and elastomeric applications. Its regular and controlled crystalline shape and ultrafine particle size together with the hydrophobic surface coating combine to the benefit of both polymer processing and subsequent physical properties. Precipitated calcium carbonate is one of a unique class of additives which can be classified as being multi functional providing the end user with an outstanding cost/performance opportunity. Some of the important uses of precipitated calcium carbonate are:

- ★ Precipitated Calcium Carbonate is widely used by Paper Industry to manufacture alkaline media paper making.
- ★ Precipitated Calcium Carbonate improves the Brightness, Smoothness, and Opacity of Paper. It also increases the ink receptivity. Precipitated Calcium Carbonate reduces the cost of production of Papermaking.



- ★ Precipitated Calcium Carbonate is widely used by Paint Industries for the manufacturing of Emulsion Paint and Powder Coatings.
- ★ Pharmaceutical Industries use precipitated Calcium Carbonate in the fermentation process and to manufacture tapped density tablet making.
- ★ Detergent Powder manufacturers for premium powders use precipitated Calcium Carbonate only.
- ★ Precipitated Calcium Carbonate is used by Rubber Product Manufacturers for the manufacturing of different rubber products like Tyres, Tubes, Hawaii Chappals, Soles, Straps and other rubber parts.
- ★ Ink manufacturers use precipitated Calcium Carbonate as an ant settling agent.
- ★ Precipitated Calcium Carbonate is used by the chewing gum, powder drinks and wine manufacturers.

### Global Scenario

Worldwide, almost 10 million tons of precipitated calcium carbonate (PCC) is produced annually for use in a wide range of end-use applications. Roughly 70% of the total is consumed by the paper industry for the filling and coating of paper. Large amounts of PCC are also used in the filling of polymers, as a pigment in paint, and as a thixotrope in sealant and plastisol formulations. In addition, PCC with sufficient purity can be used for food and pharmaceutical applications. Global demand for Precipitated Calcium Carbonate (PCC) is forecast to grow by an average of 4%py from around 13Mt in 2007 to nearly 16Mt by 2012. Growth rates will be highest in the paint (6%py) and rubber (4%py) industries though the largest increases in terms of tonnage will be in paper and paint.

The demand of PCC in the market is immense and therefore its market position is splendid. Hence it is an excellent field to venture.

### *Cost Estimation:*

Capacity	: 8925 MT/Annum
Plant and Machinery	: 129 Lakhs
Cost of project	: 321 Lakhs
Rate of return	: 43%
Break Even Point	: 56%

### Potassium Iodate

Potassium iodate is the major chemical used for iodization of edible common salt. It is also used as feed additives and as maturing agents. Besides this

it is used as dough conditioner in bread industries for bread manufacturing. Now the Govt. of India has passed an act to iodize the common edible salt at any cost considering the health factors of Indian people. Besides this the export of common salt without iodization is not possible in the overseas countries. The export of salt is opened in international market only when the salt is iodized as per BIS or ISO 9000 specification.

### **Applications**

- ★ It is used for iodization of edible Salt.
- ★ It is used in analysis or testing of Zinc and arsenic.
- ★ It is used in Eudiometry in medicine manufacturing.
- ★ It is used as a reagent.
- ★ It is used as feed additives
- ★ It is used in foods as maturing agent and dough Conditioner.

### **Global Demand**

Potassium Iodate is one of the important chemical having various industrial and commercial uses. The major application of Potassium Iodate is for iodized salt manufacturing and others as feed additive. Now a day the Govt. of India has an act to iodize all the salt which directly used for human consumption. That's why its demand has been increased to multi fold in India and even other countries of the world. The export of the Potassium Iodate is very negligible. Besides the above uses it is also used as maturing agent in bread manufacturing. So its demand is also high due to around 1500 numbers bread manufacturing unit located all over India both in organized and unorganized sector. There are about 26 manufacturing units producing Potassium Iodate to cater the need of skyrocketing demand, which is likely to be multifold in the Coming future. Potassium Iodide finds its uses in iodized salt sector to such a large extent that its demand is too high in manufacturing units located all over India both in organized and unorganized sector. The global crude iodine market is about 31,000 MT and about 70% of crude iodine is traded internationally. The four largest direct export flows are from Chile to the USA, Europe (through Belgium), China and India. China and India are the main destination markets for iodine exported from Turkmenistan, Azerbaijan, Indonesia, Iran, China, and Russia.

The demand of the product in the market is immense and therefore its market position is splendid. Hence it is an excellent field to venture.

***Cost Estimation:***

Capacity	:	150MT/Annum, Potassium Iodate 576MT/Annum, Potassium Iodate (byproduct)
Plant and Machinery	:	117 Lakhs
Cost of project	:	544 Lakhs
Rate of return	:	44%
Break Even Point	:	57%

**Glycerol Monostearate**

Glycerine Monostearate is one of the most important fatty acid esters which is widely used in the manufacture of soap, detergent, cosmetic, paint, textile and many other industries. It is used thickening and emulsifying agent for margarine, shortening and other food products also it is used in flavouring, emulsifying agent for oils, waxes and solvents, protective coating for hydroscopic powders and it is also used in the manufactures of cosmetics, opacifiers, detackifier and resin lubricants. Glycerine stearate is produced in small scale sectors only as this item is reserved for small scale sector, by government of India. Being small scale item, market survey data, such as total installed capacity, capacity utilization, actual production consumption import export, and demand supply gap are not available. Industry which already well developed consumes glycerine stearate in bulk quantity.

All this factor shows that better prospects lies in this sector for new entrants.

***Cost Estimation:***

Capacity	:	1500 MT/Annum
Plant & Machinery	:	53 Lakhs
Cost of Project	:	143 Lakhs
Rate of Return	:	43%
Break Even Point	:	59%

**Glycerine**

Glycerine is known as glycerol. Glycerol combined with fatty acids in the form of esters known as the glycerides is universally distributed and functions in the development and reproduction of all plant and animal life. Glycerol plays an important part as an intermediary product in the metabolism of the living organism but seldom remains in the free-state in natural products. It is generally agreed that in plants glycerol and the glycerides originate from carbohydrates produced by photosynthesis from carbon dioxide and water. Glycerine was first discovered in 1779 by Scheele who heated a mixture of litharge and olive oil and extracted it with water. Glycerine is used in nearly every industry.

Glycerine has wide applications in drugs and pharmaceuticals, cosmetics, in food products, in tobacco etc. Besides these, glycerine is also used as lubricant and used in manufacture of alkyd resins and explosives. It also used in textile industry and in tooth paste. Glycerine is used in cream and lotion based cosmetic to keep the skin soft and moisture. Glycerine is a greasy, so it also used in lip-stick, chip-stick, lip gloves etc. It is used in flavouring and colouring food products.

It is generally obtained as a by-product from manufacture of soaps and fatty acids. Glycerine enjoys very wide use in various industries because of its chemical and physical properties.

Glycerin competes in the market with other products such as sorbitol, glycols and many polyols from petrochemical feedstocks. If and when there would be drop in price of glycerin due to oversupply scenario, perhaps glycerin would become competitive with other products such as sorbitol and may be able to penetrate the market for sorbitol and polyols.

It has good domestic and export demand, so there is a very good scope in this sector and new entrepreneurs should venture into this field.

***Cost Estimation:***

Capacity	: 1 Ton/Day
Plant & Machinery	: 51 Lakhs
Total Capital Investment	: 174 Lakhs
Rate of Return	: 40%
Break Even Point	: 43%

**Zinc Sulphate (33%, 21% & 12%)**

Zinc sulphate is a powder that is colourless and completely water soluble. The product can be used in different applications, including some connected with maintaining good health. Zinc sulphate is chiefly used in fertilizer applications and animal feed supplements. It is specially applied on crops such as pecan, deciduous fruits, peanuts, cotton, corn and citrus and also added to feed of swine and poultry. The second major use of zinc sulphate is to manufacture of viscose rayon fiber. It is also an ideal source of zinc for the production of zinc stearate. It has several more applications in chemicals, pigment, preservation and clarification of glue, in flame proofing compounds, as a mining flotation agent, wood preservative, in electrometallurgy and electro-galvanizing.

Due to multi applications there is good demand of zinc sulphate. So, new entrants can well venture in to this field.

***Cost Estimation:***

Capacity	:	1487 MT/Annum (Zinc Sulphate 33% Powder)
		2975 MT/Annum (Zinc Sulphate 21% Powder)
		4065 Kts/Annum (Zinc Sulphate 12% Solution)
Plant & Machinery	:	142 Lakhs
Cost of Project	:	414 Lakhs
Rate of Return	:	38%
Break Even Point	:	50%

**Hydrogen Peroxide**

Hydrogen peroxide ( $H_2O_2$ ) is an oxidant commonly used as bleach. It is the simplest peroxide. Hydrogen peroxide is a clear liquid slightly more viscous than water that appears colourless in dilute solution. It is used as a disinfectant, antiseptic, oxidizer and in rocketry as a propellant. The oxidizing capacity of hydrogen peroxide is so strong that it is considered a highly reactive oxygen species. For producing hydrogen peroxide natural gas is a feed stock. End user industries are landfills, oil refining, mining, textiles, power producers, potable water, chemicals and resins, food processing, electronics, pulp and paper and many more.

Due to its multiple uses the demand is growing day by day. Any entrepreneur venture in to this field will be successful.

***Cost Estimation:***

Capacity	:	3000 MT/Annum
Plant & Machinery	:	710 Lakhs
Total Capital Investment	:	1355 Lakhs
Rate of Return	:	37%
Break Even Point	:	47%

**Manganese Sulphate**

Manganese sulphate is commercially one of the most important compounds. It is an important mineral based chemical industry. The main constituent of this industry is manganese obtainable from mines, which can be converted in to manganese sulphate and manganese dioxide. Manganese finds number of uses in various industries like potteries, varnishes, medicines, textile dyeing, fertilizers, wines and many more. The consumption of this chemical is more than 1,50,000 MT per annum. This figure is likely to be increased every year due to coming up more and more manganese sulphate consuming industries.

So, there is good scope for new entrants in this industry.

**Cost Estimation:**

Capacity	:	600 MT/Annum	(Manganese Sulphate)
Plant & Machinery	:	35 Lakhs	
Total Capital Investment	:	135 Lakhs	
Rate of Return	:	47%	
Break Even Point	:	41%	

**Hydrazine Hydrate**

Hydrazine  $N_2H_4$ , a colourless liquid having an ammoniacal odor, is the simplest diamine and unique in its class because of the  $N-N$  bond. It was first prepared in 1887 by Curtius as the sulfate salt from diazoacetic ester. Hydrazine and its simple methyl and dimethyl derivatives have endothermic heats of formation and high heats of combustion. Hence, these compounds are used as rocket fuels. Other derivatives are used as gas generators and explosives. Hydrazine, a base slightly weaker than ammonia, forms a series of useful salts. As a strong reducing agent, hydrazine is used for corrosion control in boilers and hot-water heating systems; also for metal plating, reduction of noble-metal catalysts, and hydrogenation of unsaturated bonds in organic compounds. Hydrazine is also an oxidizing agent under suitable conditions. Having two active nucleophilic nitrogens and four replaceable hydrogens, hydrazine is the starting material for many derivatives, among them foaming agents for plastics, antioxidants, polymers, polymer cross-linkers and chain-extendors, as well as fungicides, and pharmaceuticals. Hydrazine is also a good ligand; numerous complexes have been studied. Many heterocyclics are based on hydrazine, where the rings contain from one to four nitrogen atoms as well as other heteroatoms. The many advantageous properties of hydrazine ensure continued commercial utility. Hydrazine is produced commercially primarily as aqueous solutions, typically 35, 51.2, 54.4, and 64 wt%  $N_2H_4$  (54.7, 80, 85, and 100% hydrazine hydrate). Anhydrous hydrazine is produced for rocket propellant and limited commercial applications.

Hydrazine is used in many processes including: production of spandex fibers, as a polymerization catalyst; a blowing agent; in fuel cells, solder, fluxes; and photographic developers, as a chain extender in urethane polymerizations, and heat stabilizers. In addition, a semiconductor deposition technique using hydrazine has recently been demonstrated, with possible application to the manufacture of thin-film transistors used in liquid crystal displays. Hydrazine in a 70% hydrazine, 30% water solution is used to power the EPU (emergency power unit) on the F-16 fighter plane. The explosive Astrolite is made by combining hydrazine with ammonium nitrate.

Hydrazine hydrate is an organic chemical raw material with extensive applications. The world's capacity to produce hydrazine hydrate has reached



more than 200 thousand t/a today (based on 100% hydrazine content). The capacity is divided nearly equally between Europe, Asia and America (35%, 34% and 30%, respectively), with only 1% in other regions. Major producers include Olin of the United States, Bayer of Germany, Ato of France and Mitsubishi Gas Chemical of Japan.

The worldwide market demand for hydrazine hydrate is 80 to 90 thousand tons a year. Consumption is roughly 32% for pesticides, 33% for foaming agents, 20% for water treatment agents and 15% for others. Demand will grow steadily in future, with demand in advanced countries declining while demand in developing countries, Asian countries in particular, growing rapidly.

There is a very good scope and market potential in this field and new entrepreneurs should venture into this sector.

#### *Cost Estimation:*

Capacity	: 9000 MT/Annum
Plant & Machinery	: 3658 Lakhs
Cost of Project	: 4773 Lakhs
Rate of Return	: 46%
Break Even Point	: 38%

#### **7-Aminocephalosporanic Acid (7-ACA)**

7-ACA or 7-Aminocephalosporanic acid is made from Cephalosporin C and is a key intermediate for synthesizing cephalosporin antibiotics, the  $\beta$ -lactam antibiotics family. 7-ACA is a starting compound for the production of various semi-synthetic cephalosporins of different generations. These compounds are made by modification of the side chains at positions 3 and 7 of 7-aminocephalosporanic acid (7-ACA). It is used to produce many cephalosporins pharmaceutical bulks, such as cefazolin sodium, cefotaxime sodium, ceftriaxone sodium, cefoperazone sodium, ceftazime sodium, cefuroxime sodium and so on. Originally, the commercial processes were based on solvent extraction. 7-Aminocephalosporanic acid (7-ACA), until recently it has been produced by chemical deacylation of the natural antibiotic cephalosporin C. The disadvantage of this method is multiple steps, low yield, use of various organic solvents and treatment of a lot of toxic waste. Alternatively, 7-ACA can be produced by a simpler and more environmentally sound process using a bio-catalytic method based on DAAO and glutaryl hydrolase for enzymatic deacylation of CPC to 7-ACA. However, few enzymes capable of this direct deacylation have been discovered, probably because of the unusual nature of the D-aminoadipyl side chain of cephalosporin C. Enzyme engineering is a fast-growing application in the pharmaceutical market.

The cephalosporins belong to the family of  $\beta$ -lactam antibiotics. These are named after the reactive moiety of the compounds, the  $\beta$ -lactam ring. In CPC, the four-membered  $\beta$ -lactam ring is coupled to a six-membered dihydrothiazine ring to form the nucleus, 7-aminocephalosporanic acid (7-

ACA), and a side chain,  $\alpha$ -aminoadipic acid, is coupled via an amide bond to the nucleus.

Demand for 7-ACA is principally determined by the market sales scale of downstream products. In terms of developing trend, ceftriaxone and cefazolin were two mainstream products of 7-ACA. Therefore, the market change in these two products directly affected the change in production-sales relations of 7-ACA. After dosage conversion, according to estimate the use of 7-ACA for making ceftriaxone accounted for 47.7% of the total consumption of 7-ACA. Obviously, ceftriaxone had become the biggest consumer of cephalosporins raw materials of 7-ACA series, followed by cefazolin. Not only ceftriaxone boosted morale, but cefotaxime, cefazolin sodium, cefoperazone sodium, cefoperazone sulbactam, ceftazidime, cefuroxime, etc were also the direct contributors of the family.

At present there is no production of 7-ACA in the country and the demand is met by imports. There is a good scope for capacity creation in India. New entrepreneurs should venture into this sector.

#### *Cost Estimation:*

Capacity	: 150 MT/Annum
Plant & Machinery	: 1486 Lakhs
Cost of Project	: 2167 Lakhs
Rate of Return	: 64%
Break Even Point	: 42%

#### **Ethylene Oxide**

Ethylene oxide is a flammable, colourless gas. The Ethylene oxide is highly reactive chemical and can react specially in the presence of a catalyst with compounds such as water, alcohols, ammonia, amines, and organic acids.

Ethylene oxide, the simplest of the cyclic ethers, is a colourless gas at room temperature and normal pressure. Ethylene oxide has been produced commercially by two basic routes: From ethylene chlorohydrin, direct oxidation process. Ethylene oxide is produced by reacting ethylene with oxygen in the presence of a silver catalyst. Ethylene glycols are the most well known derivatives of ethylene oxide. These are produced by hydration of ethylene oxide; monoethylene oxide is the largest volume product, with diethylene glycol and triethylene glycol as co-products.

Ethylene oxide is a reactive chemical, and other derivatives it forms include ethanolamines on reaction with ammonia, which are used in gas processing, detergents and soaps and cement grinding. Other derivatives of ethylene oxide include polyethylene glycols for cosmetics, lubricants and plasticizers, and ethoxylates for detergents and surfactants. Ethylene oxide is known to be a human carcinogen based on sufficient evidence of

carcinogenicity from studies in humans, including a combination of epidemiological and mechanistic investigations which indicate a casual relationship between exposure to ethylene oxide and human cancer.

Ethylene oxide is found in the production of solvents, antifreeze, textiles, detergents, adhesives, polyurethane foam, and pharmaceuticals. It is also useful in fumigants, sterilants for spices and cosmetics, as well as during hospital sterilization of surgical equipment. The major use of ethylene oxide is in the production of ethylene glycol. The primary end use for ethylene glycol is in the production of polyester polymers.

The largest outlet for ethylene oxide (EO) is ethylene glycol (EG), which accounts for three-quarters of EO consumption globally. Other derivatives include ethoxylates, ethanolamines, glycol ethers and polyethylene glycols. Monoethylene glycol (MEG) is the primary glycol which is used mainly to make polyester followed by automotive antifreeze, which is the second largest market for antifreeze formulations. MEG demand is expected to grow at 5-6% per year globally. This is partly driven by the strong demand for polyester fibre in Asia where it is used in the production of textiles. However, this has been at the expense of the developed markets of Western Europe and North America where polyester fibre demand is stagnant. Fortunately, demand for polyethylene terephthalate (PET) bottle resin has been growing strongly in all regions of the world as it replaces glass used in water, carbonated drinks and food containers.

EO demand is expected to grow at around 5%/year globally. The percentage of domestic ethylene oxide consumed in ethylene glycols varies widely amongst regions. According to survey, this varies from 44% in Western Europe, 63% in Japan and 73% in North America to 90% in the rest of Asia and 99% in the Middle East and Africa.

There is a very good scope for this product and new entrepreneurs should venture into this field.

***Cost Estimation:***

Capacity	: 7500 MT/Annum
Plant & Machinery	: 2871 Lakhs
Cost of Project	: 4042 Lakhs
Rate of Return	: 42%
Break Even Point	: 33%

**Acrylic Acid and Its Derivatives  
(Butyl Acrylate, Methyl Acrylate, Ethyl Acrylate)**

Acrylic acid has served, for more than 30 years, as an essential building block in the production of some of our most commonly used industrial and

consumer products. Approximately two-thirds of the acrylic acid manufactured is used to produce acrylic esters - methyl acrylates, butyl acrylates, ethyl acrylates, and 2-ethylhexyl acrylates - which, when polymerized are ingredients in paints, coatings, textiles, adhesives, plastics, and many other applications.

The remaining one-third of the acrylic acid is used to produce polyacrylic acid, or crosslinked polyacrylic acid compounds, which have been successfully, used in the manufacture of hygienic products, detergents, and wastewater treatment chemicals.

The largest application for acrylates esters is the production of surface coatings (48%), followed by adhesives and sealants (21%), plastic additives and co-monomers (12%), paper coatings, and textiles and surface coatings account for 55% of acrylates ester consumption.

Acrylic acid and esters are perhaps the most versatile series of monomers for providing performance characteristics to thousands of polymer formulations. Incorporation of varying percentages of acrylates monomers permits the production of thousands of formulations for latex and solution copolymers, copolymer plastics and cross-linkable polymer systems. Their performance characteristics—which impart varying degrees of tackiness, durability, hardness and glass transition temperatures—promote consumption in many end-use applications.

The world acrylic acid business is characterised by the involvement of a relatively few major players who have both globalised and set up a range of strategic alliances, joint ventures and new integrated companies. According to the leading suppliers of acrylic acid, the annual demand growth will stay at the level of 5% in the coming years. However, according some experts, this growth by 2009 may be lower, not more than 3.5% per annum. Glacial acrylic acid is used in the manufacture of super absorbing polymers (SAP), which account for 32% of the global demand for acrylic acid. They predict the following demand growth figures for various segments of acrylic acid consumption: 3.6% per year for acrylates and 5% per year for superabsorbent. The global market is set to continue to grow in excess of 3%/year, pulled by Asia, China, and India in particular. The Middle East and Africa are also showing firm growth rates.

Global demand growth is forecast at 4.8%/year to 2010. Regionally, consumption will rise by 10%/year in Asia-Pacific, 5%/year in Africa, 6%/year in Asia and the Middle East, 4%/year in Australia, New Zealand and eastern Europe, 3%/year in Americas and western Europe, and 1%/year in Japan.

Looking at the growing market demand, new entrepreneurs should venture into this field.

***Cost Estimation:***

Capacity	:	Acrylic Acid – 30000 MT/Annum Butyl Acrylate – 10000 MT/Annum Methyl Acrylate – 10000 MT/Annum Ethyl Acrylate – 10000 MT/Annum Acetic Acid as By product – 3000 MT/ Annum
Plant and Machinery	:	225 Crores
Cost of Project	:	312 Crores
Rate of Return	:	46%
Break Even Point	:	36%

**Precipitated Silica**

Precipitated Silica is composed of aggregates of ultimate particles of colloidal size that have not become linked in massive gel network during the preparation process. Precipitated silica prepared by the action of acid on a solution of soluble silicate is of fine controlled particle size & porous in nature. Precipitated silica powders have a more open structure with higher volume than dried pulverized gels. Amorphous silica is precipitated from super saturated solution obtained by concentrating an under saturated solution a hot saturated solution or generating  $\text{Si(OH)}_4$  of silica ester  $\text{SiH}_4$ ,  $\text{SiS}_2$ ,  $\text{SiCl}_4$  or Si. It was reported in 1840 that amorphous silica in the presence of excess alkali become a liquid & that subsequent neutralization of the liquid with acid caused precipitation of silica.

The physical & chemical properties of precipitated silica vary according to the manufacturing process. Ultimate & aggregate particle size in silica's precipitated from solution can be varied by reinforcement & control of suspension pH, temperature & salt content. The particle size in gynogenic silica's is controlled by combustion conditions. The surface area as determined by nitrogen adsorption is a function of particle size.

Precipitated silica is used as filler for paper & rubber as a carrier & diluents for agricultural chemicals, as an anti-caking agent, to control viscosity & thickness and as molecular sieve. The distinguishing feature of the growth of precipitated silica industry in India is that it has classifiably flourished in the small-scale sector. Readily available new materials low capital investment & high rates of return offer a distinct advantage to the small-scale manufacturers to venture into this field.

So, we can better understand the growing demand of precipitated silica with the growth of end user industries.

***Cost Estimation:***

Capacity	:	100000 MT/Annum
Plant & Machinery	:	Rs. 1350 Lakhs
Cost of Project	:	Rs. 3250 Lakhs
Rate of Return	:	42%
Break Even Point	:	64%

**Sodium Silicate**

Sodium Silicate is an inorganic chemical that has versatile properties, which cannot be obtained with others alkaline salts. Sodium silicates are also known as water glass or liquid glass. Sodium silicate is stable in neutral and alkaline solution. In acidic solutions, the silicate ions react with hydrogen ions to form silica acid, which when heated and roasted forms silica gel, a hard, glassy substance. Sodium carbonate and silicon dioxide react when molten to form sodium silicate and carbon dioxide. The properties and many functional characteristics of the soluble could be used efficiently and economically to resolve most of the problems that arise in some chemical and industrial processes.

Sodium silicates are used in many industries and customer applications as adhesives, detergents, cements, deflocculates, drilling muds for oil wells, enhanced oil recovery, pipe line insulation also in steel industry, welding rods, foundry cores, metal cleaning, palletizing, ore flotation and others. It's also used for de-inking, sizing, coating and bleaching of recycled paper products in the pulp and paper industry. Sodium silicates and hydrogen peroxide are used together for the bleaching of cellulose.

Due to wide end uses, it is found that there is good demand of sodium silicate. Entrepreneurs can well venture into this field.

***Cost Estimation:***

Capacity	:	500000 MT/Annum
Plant & Machinery	:	Rs. 1350 Lakhs
Cost of Project	:	Rs. 5450 Lakhs
Rate of Return	:	41%
Break Even Point	:	74%

**Zinc Sulphate 21% (Agriculture Grade)**

ZnSO<sub>4</sub> is very water soluble, clear, crystalline compound prepared by heating Zinc Sulphate ore in air & dissolving out & recrystallizing the sulphate. Zinc Sulphate is an inorganic salt composed by the elements zinc, sulphur and oxygen. It has 7 moles of water molecule in the crystals during crystallisation.

It is largely used as micro elements in the agricultural field as supplied trace minerals as zinc. It is used as essential micro elements. It is basically prepared from zinc ash and sulfuric acid reaction. Zinc ash generally content



40-45% zinc. From this pure 100% zinc sulphate may be prepared. But 21% concentrated zinc sulphate is required for agricultural purpose. It is economic for farmers. It can be long time store at room temperature.

Zinc sulphate can be used for precipitating bath for viscous manufacture. It is used in medicines as an emetic astringent or disinfectant, it can be used for water treatment, and it can be used as wood preservatives, additives for paper bleaching and flocculent.

At present there are number of manufacturers engaged in the manufacture of zinc sulphate in the country. Considerable amount of zinc sulphate required for various industrial applications is of high purity & analytical reagent grades. With the recent revolution in modern agricultural cultivation the use of technical grade zinc sulphate is bound to increase tremendously in the near future.

Zinc sulphate is used as a micro nutrient, which increase the fertility of the land. India is agriculture base country. So, demand of fertilizers is increasing rapidly. Zinc sulphate is one of the most important fertilizers. So, there is good scope for new entrants in this project.

***Cost Estimation:***

Capacity	: 10 MT/annum
Plant & Machinery	: 62 Lakhs
Total Capital Investment	: 284 Lakhs
Rate of Return	: 40%
Break Even Point	: 52%

**Methyl Methacrylate (Monomer) from Acrylic Scrap**

Methyl methacrylate, is known for its excellent transparency and weather ability, as well as its easy recyclability. The acrylic has attracted a great deal of attention for environmental considerations. Methyl methacrylate is key monomer for acrylic resins, coating materials, and polymers that meet the fast rising demand for light guide panels in LCD assemblies. It is produced by direct oxidative esterification, which is a revolutionary process technology. The persistence of methyl methacrylate in the atmosphere is short, and the chemical is not considered to contribute directly to depletion of the ozone layer. Methyl methacrylate is not expected to bioconcentrate in the environment, and inhalation from air is likely the primary route of human exposure.

The disposal of waste plastics has become a major worldwide environmental problem. The multi-million tons of post-consumer plastic waste which are generated annually were previously dumped in land fill sites.

Methyl methacrylate is used in the manufacture of resins and plastics. It is used in the manufacture of methacrylate resins and plastics, textile auxiliaries and sizing materials, & it is also used in the impregnation of concrete to make it water repellent, and also has used in the fields of medicine and dentistry to make prosthetic devices and as a ceramic filler or cement.

A growth sector has been electronic applications for PMMA where it is used in flat screen televisions and liquid crystal displays. Demand in this application has seen strong growth up to 2008 but, was expected to decline for the first time in 2009 as consumers put off purchases of flat screen TVs and Computer monitors.

This industry is expanding rapidly, so, there is a good scope to enter in this field.

***Cost Estimation:***

Capacity	: 300000 Ltrs./Annum
Plant & Capacity	: 72 Lakhs
Total Capital Investment	: 195 Lakhs
Rate of Return	: 40%
Break Even Point	: 48%

**Sodium Petroleum Sulfonate**

A sulfonate is a salt or ester of a sulfonic acid. It contains the functional group  $R-SO_2O$ . Anions with the general formula  $RSO_2O^-$  are called Sulfonate. They are the conjugate bases of sulfonic acids with formula  $RSO_2OH$ . As sulfonic acids tend to be strong acids, the corresponding sulfonates are weak bases. Due to the stability of sulfonate anions, the cations of sulfonate salts such as scandium triflate have application as Lewis acids.

Sulfonic acid, organic compound containing the functional group  $RSO_2OH$ , which consists of a sulfur atoms, S, bonded to a carbon atom, that may be part of a large aliphatic or aromatic hydrocarbon R, and also bonded to three oxygen atoms, O, one of which has a hydrogen atom, H, attached to it. The hydrogen atoms make the compound acidic, much as the hydrogen of a carboxylic acid makes it acidic. However, while carboxylic acids are weak, sulfonic acids are considered strong acids.

The most important use of sulfonic acids salts is in the detergent industry. Sodium Salts of long-chain aliphatic or aromatic sulfonic acids are used as detergents. Unlike ordinary soaps, which contain Carboxylic acid salts, soaps containing sulfonates do not form a scum in hard water because the calcium and magnesium ions present in the hard water do not form a scum in hard water because the calcium and magnesium ions present in the hard water do not form insoluble precipitates with sulfonates as they do with carboxylates. Some sulfonate acid derivatives, e.g. the sulfa drugs, are important as antibiotics.

Sodium petroleum sulfonate enjoys a good market in India and will continue to do so in the coming years. There is maximum use of sodium petroleum sulfonate in the Chemical Industry. Due to increase the use of sodium petroleum sulfonate, it can be concluded that the demand will also increase

in coming years. So, there lies a great scope for further expansion in near future.

***Cost Estimation:***

Capacity	: 900 MT/Annum
Plant & Machinery	: 122 Lakhs
Cost of Project	: 307 Lakhs
Rate of Return	: 41%
Break Even Point	: 55%

**Antiscaling/Descaling Forming Chemicals**

Water has been called the universal solvent, because it dissolves many substances. It never occurs in nature in a pure state, because ground water picks up impurities as it seeps through rock strata. Surface water contains organic matter and insoluble suspended matter such as sand and silt. Even rain picks up oxygen and carbon dioxide as it falls to earth.

When water is turned into steam, the minerals previously dissolved in the water are left behind and deposit a scale on the surface equipments like boilers and evaporators. Since water is key ingredient used in a boiler system, it is important to understand just exactly what is in the water you will be using. This scale, mostly calcium and magnesium is an excellent insulator and slows the transfer of heat to the water.

Boiler failure occurs when scale is allowed to accumulate steel retains its strength up to 700° F, and it starts to weaken above that point. At 1000° F it has a hard time supporting its own weight. Start adding insulation such as scale between the metal and water, and the metal temperature increases. With enough scale, the metal will overheat causing blisters, bags and eventually a ruptured pressure part. Scale can also increase the fuel consumption in boilers.

Water hardness becomes an issue as soon as heat is applied in the boiler system. The most common problem is that of scale formation, a problem that will rob your system of the efficiency it was designed to deliver. Descaling and antiscaling chemicals provides the safest, most cost effective process to chemically remove scale, sugar, oil and other contaminants from equipment surface.

So, in future there is good scope for new entrepreneur.

***Cost Estimation:***

Capacity	: 1000 Litres/day
	Antiscaling/Descaling Chemicals
Plant & Machinery	: 36 Lakhs
Total Capital Investment	: 174 Lakhs
Rate of Return	: 42%
Break Even Point	: 43%

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### **L-Ascorbic Acid**

L-Ascorbic acid is an organic acid with antioxidant properties. Its appearance is white to light yellow crystals or powder. It is water-soluble. The L-enantiomer of ascorbic acid is commonly known as vitamin C. L-Ascorbic acid is a versatile water soluble radical scavenger widely distributed in aerobic organisms that plays a central role in the protection of cellular components against oxidative damage by free radicals and oxidants that are involved in the development and exacerbation of a multitude of chronic diseases such as cancer, heart disease, brain dysfunction, aging, rheumatism, inflammation, stroke, emphysema, and AIDS. L-Ascorbic acid (also called vitamin C) is a carbohydrate-like substance involved in the metabolic functions including synthesis of collagen, maintenance of the structural strength of the blood vessels, metabolism of certain amino acids, and the synthesis or release of hormones in the adrenal glands. It occurs as a white or slightly yellow crystal or powder with a slight acidic taste. L- Ascorbic Acid is freely soluble in water; sparingly soluble in alcohol; insoluble in chloroform, ether, and benzene.

### **Source of L-Ascorbic Acid**

The main sources of L-ascorbic acid for humans are from plants and animals with indigenous biosynthetic capabilities of producing L-ascorbic acid. The ubiquitousness of L-ascorbic acid throughout the human body emphasizes its daily requirement and vitality as a nutrient for healthy maintenance. Its biological half-life in humans is 14-40 days after normal intake and a vitamin-C-free diet in a human develops scurvy in about 3-4 months.

The vast majority of species of plants and animals are known to synthesize their own vitamin C. A majority of vertebrates such as amphibians, reptiles, birds, and mammals are able to synthesize L-ascorbic acid. Molecules similar to ascorbic acid are made by some fungi but not by bacteria.

### **Applications**

Ascorbic acid (Vitamin C) is an essential nutrient that the human body cannot manufacture from other compounds.

- ★ It is needed for the formation of collagen, the protein that makes up connective tissue, and is essential to muscles, bones, cartilage, and blood vessels.
- ★ Ascorbic acid is also a good anti-oxidant, preventing damage from oxygen free radicals.
- ★ Ascorbic acid (vitamin C) is used extensively in the food industry, not only for its nutritional value but for its many functional contributions to product quality.

- ★ Acting as an antioxidant, ascorbic acid can improve the color and palatability of many kinds of food products. By removing oxygen from its surroundings, ascorbic acid in its reduced form becomes the oxidized form, de hydro ascorbic acid (see in the fig). This oxidizing action reduces the available oxygen in its immediate environment, making ascorbic acid an effective antioxidant.
- ★ L-ascorbic acid or L-ascorbate is a vital nutrient for many animals, including humans. It is an antioxidant which protects the body against oxidative stress.

### Market Scenario

Ascorbic acid is major food ingredients, and also plays a major role in the fermentation industry. In the past ten years, the markets for these products have changed dramatically. The demand for ascorbic acid in food and non-food applications has increased continuously and substantial capacities have been built up. The global market for isoascorbic acid, ascorbic acid and citric acid is estimated at \$1,700 million. Food applications account for \$1,080 million, feed applications for \$90 million. Chinese producers currently have a market share of 37% in isoascorbic acid, 65% in ascorbic acid and 34% in citric acid. Sales of isoascorbic acid will grow at an average annual growth rate (AAGR) of 2.9%. The European market for citric acid accounts for a total of 37% of sales and the U.S. market for 28% of sales.

Current world production is estimated at approximately 80,000 metric tons per year with a worldwide market in excess of \$600 million. It is synthesized both biologically and chemically from D-glucose.

#### *Cost Estimation:*

Capacity	:	240 MT/Annum
Plant and Machinery	:	72 Lakhs
Cost of project	:	211 Lakhs
Rate of return	:	42%
Break Even Point	:	58%

### Sulfuric Acid

It is a strong acid, is an oily, viscous water white non-volatile liquid. It absorbs water from the atmosphere. The acid has a corrosive action on the skin, even a drop on the skin can cause burn. The acid is used as a solvent, a dehydrating agent, a reagent in chemical reactions or process as catalyst, an absorbent etc. Source of sulphuric acid may be iron pyrites (35%), sulphur (48%), the waste gases of non ferrous metallurgy (15%) and hydrogen sulphide

(4%). Sulphuric acid is one of the most important basis chemicals during war place. It is mainly used for the manufacture of fertilisers (ammonium sulphate, super phosphate), other acids (hydro chloric, Nitric, phosphoric & chromic acids) and salts, dichromates, eprom salt, green coppers, aluminium sulphate and alum, copper sulphate, zinc sulphate etc. It is used in oil refining, the pickling of metal, the electrolytic refining of metals like copper, in electrical batteries and in manufacture of textiles, food products, synthetic drugs & dyestuffs and explosives.

#### *Cost Estimation*

Plant Capacity	: 6 MT/Day
Plant & Machinery	: Rs. 140.40 Lakhs
W.C. for 3 Months	: Rs. 270.91 Lakhs
Total Capital Investment	: Rs. 479.46 Lakhs
Rate of Return	: 14%
Break Even Point	: 16%

#### **Ethanol from Rice/Rice Straw/ Rice Husk/Rice Bran**

Ethanol productions from cellulosic materials offer a solution to some of the recent environmental, economic, and energy problems facing worldwide. Nationally, energy costs are on the rise and forecasts of petroleum supply disruptions are once again making news. People are not immune to these events & feel the impact of rising energy prices every time they purchase gasoline, diesel or other petroleum products.

Cereal straw, one of the most abundant renewable lignocellulose resources which possess valuable components, has gradually become the research hot spot as a promising substitute for both the fossil fuel resource & petroleum based industry with the increasing calling for bio-fuel and green chemistry. Fermenting sugars produces ethanol. Lignocelluloses materials such as agricultural, hardwood & softwood residues are potential sources of sugars for ethanol production.

Ethanol from Rice Straw is manufactured by fermentation. The word fermentation referred originally to the anaerobic metabolism of organic compounds by micro organism compounds simpler than the starting material the modern definition is that of any microbial action controlled by man to make useful product. Some of the substances produced from carbohydrates on a commercial scale by anaerobic microbial metabolism include ethanol and lactic acid.

The most important consideration in industrial fermentation is the selection of the proper micro organisms. This choice must provide suitable stability of the process, where upon the engineering and development aspects of process



design may initiated. Stock cultures of micro organisms useful in industrial fermentations are usually maintained by the manufacturer, and less frequently in commercial collection or collections at academic or government laboratories.

The ethyl alcohol is used as a blend with petrol and the potential for chemicals is being tapped in India. Many of these chemicals are now being made on a much larger scale from petroleum fractions or natural gas liquids. But the advantage of using ethyl alcohol is that the processes are simple, efficient and workable at a smaller capacity level in plants distributed all over the country and not concentrated in centralized complexes.

While the technical possibility of chemical conversion of ethyl alcohol is wide, there is need to choose specific items where the advantages exist. India has emerged as the largest user of ethyl alcohol for chemicals over the past three decades. Ethyl alcohol derived from sulphite pulp plants served as a base for limited quantities of select chemicals in Norway and Sweden in the immediate post-war years and ethyl alcohol derived from molasses was also used for chemicals in the U.K. at that time. In fact, the early production of polyethylene was based on ethyl alcohol in the U.K. France too was exploiting the ethyl alcohol route to chemicals. The U.S. installed a big plant for making synthetic rubber from the two intermediates, styrene and butadiene, derived from ethyl alcohol produced from corn (starch). But the end of the war led to it being closed down.

The era of petroleum-derived chemicals, mostly using ethylene and propylene, began in the late Fifties and early Sixties displacing ethyl alcohol as feedstock. Ethyl alcohol ended its tenure as a chemical feedstock in Europe but emerged as a fuel for automobiles in Brazil and in the U. S. Brazil also took up alcohol-based chemicals in a limited way and is now lagging behind India in this area. The U.S. and Europe have little of ethyl alcohol as base for chemicals. Other sugar producing countries such as Cuba, Thailand and Malaysia have not entered this field. The main factor is the large demand and scale of operations, where a petroleum-base dominates.

There is a good opportunity and scope for new players to venture into this field.

***Cost Estimation:***

Capacity	:	9000 Kls./Annum
Plant and Machinery	:	1092 Lakhs
Cost of Project	:	2201 Lakhs
Rate of Return	:	43%
Break Even Point	:	43%

### **Furfural Alcohol From Furfural (Hydrogenation)**

Today the wide spread use of furfural alcohol in foundry resins is the principal outlet of this renewable chemical. Never the less, the low viscosity and high reactivity of furfural alcohol and the outstanding chemical, mechanical and thermal properties of its polymers have led to successful applications in other fields than the foundry. Furfural alcohol is produced by catalytic hydrogenation of furfural in a vapour or liquid phase using copper catalyst.

The majority of furfural alcohol is used primarily in the production of furan resins for foundry sand binders in the metal casting industry. Furan is a generic term for binders containing furfural alcohol and either urea or phenol formaldehyde or mixture of both. It is also used in lube oil refining, grinding and abrasive wheels, pharmaceuticals, and phenolic resins. There is a good demand of furfural alcohol and new entrepreneurs can enter into this field.

#### ***Cost Estimation:***

Capacity	:	900 kls/Annum
Plant & Machinery	:	157 Lakhs
Cost of Project	:	380 Lakhs
Rate of Return	:	42%
Break Even Point	:	60%

### **Carbon Black from Oil of Tar**

Carbon black is a semi graphitic form of carbon prepared in a fine state of subdivision by the partial combustion of hydrocarbons. These hydrocarbons may be either gaseous or liquid by products of the petroleum industry. Carbon black is the most finely divided and blackest pigment available to industry. The carbon-black industry dates from about 1878, when comparatively large volumes of natural gas became available in the oil fields of Pennsylvania and West Virginia. The rubber industry consumes about 94 percent of all carbon black produced. The largest use is in the manufactures of tires. It is in this application that the reinforcing ability of carbon black is most strikingly displayed. High loadings are also employed in the carcass, treat base, side wall, and inner tubes. Each application has its particular requirements. The ability of carbon black to provide toughness and wear properties is manifested in rubber of all types, both natural and synthetic.

The Indian carbon black market is dominated by the top three players in the industry Philips carbon black, Hi-tech carbon and Cabot India. Through its organic and inorganic growth, the Indian carbon black industry is set to be a top global player in the near future. There is good scope for new entrants into this field.

***Cost Estimation:***

Capacity	:	50000 MT/Annum
Plant & Machinery	:	819 Lakhs
Cost of Project	:	1730 Lakhs
Rate of Return	:	41%
Break Even Point	:	73%

**Cadmium Brightener**

Cadmium brighteners are chemicals which are in liquid form or in solid form. Liquids are used for brightening the cadmium plates by dipping the plates in the solution or dry solid or mixed of solid are used for brightening of cadmium plates for polishing. Basic chemical compounds are used Diphenyl Sulfonates, Naphthalene, Disulfonic, Sulfuric Acid, Chromic Acid, Sodium Sulfate etc. This is generally manufactured by very few in organized sectors and mainly by private sectors. It can be predicted that there is fair scope for the new entrepreneur. He may take order rises or merit for launching this product line without other brighteners. The demand for this product is good. There is good scope for new entrants in this field.

***Cost Estimations:***

Plant Capacity	:	1500000 Ltrs./Annum
Plant & M/c	:	17 Lacs
Cost of Project	:	50 Lacs
Rate of Rate	:	37%
Break Even Point	:	40%

**Guar Hydroxy Propyl Triammonium Chloride**

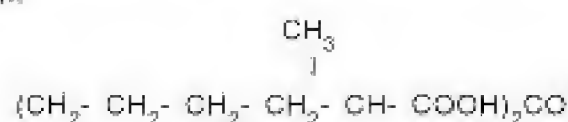
Guar is natural vegetative source of carbohydrate, which is basically used in the food as well as in the adhesive industries. Now there is a conversion of guar to it's derivatives using different chemicals and conditions. Guar Hydroxy Propyl Triammonium Chloride is one of the guar derivatives, which is used as basic raw material in cosmetic industry. This product has good market demand. Any new entrepreneur going for this project will get good market in future.

***Cost Estimation:***

Plant Capacity	:	1MT/Day
Plant & Machinery	:	Rs. 41 Lakhs
W. C. For 3 Months	:	Rs. 47 Lakhs
Total Capital Investment	:	Rs. 142.00 Lakhs
Rate of Return	:	53.10%
Break Even Point	:	69.08%

### Cobalt Octoate

Cobalt Octoate is a very important compound having chemical formulas as such,



The I.U.P.A.C. (International Union of Pure & Applied Chemistry) of the cobalt octoate is as under. Cobalt-2-Ethyl-Hexanoate. Cobalt octoate is being used – As driers in the paint industries, as a whiteners, useful as siccatives in lacquers & paints or for warranting adhesion between rubber & metal supports. The progress of the industry is spectacular particularly after the lifting of the price control though the industry is not free from troubles, it has experienced in recent years an annual growth rate of 15 percent. Cobalt octoate may be used widely for soaps which have wide market in India, as they come under the essential goods category. The Indian soap industry is about 110 years old. Another factor which enhanced importance of R & D is the peculiar Indian washing habit. A new entrepreneurs can enter in this field will be successful.

#### *Cost Estimations:*

Plant Capacity	: 30000 Kg/Annum
Plant & M/c	: 16 Lacs
Cost of Project	: 37 Lacs
Rate of Return	: 40%
Break Even Point	: 52%

### Soda Ash ( $\text{Na}_2\text{CO}_3$ )

Soda ash is a chemical trade name denoted by the anhydrous sodium carbonate, or simply "Soda". The dehydrate variety of soda ash is frequently known in commerce by the names "Sal Soda". Soda ash is also differentiated into two classes viz natural ash if the salt is recovered from naturally occurring sodium carbonate, the synthetic ash if it is the product of the solvay or other similar commercial processes. Soda ash is known as sodium carbonate. It is one of the most important inorganic chemicals amongst others such as caustic soda, sulphuric acid, phosphoric acid and chlorine. The country is self – sufficient in the production of basic inorganic chemicals.

Sodium carbonates are the backbone of modern industries. Their uses, particularly of soda ash, are so many and varied that there is hardly any industry which does not consume the carbonates. About 50 percent of the

soda ash produced is used by the chemicals industry in soaps and detergents industry, it is used in the neutralization of fatty acids, as a builder in detergents formulations and in the manufacture of laundry soap; and as an ingredient in many industrial cleaning compounds.

Soda ash is being produced in India by two main conventional processes like standard solvay process and dual process. In the solvay process, the main raw materials are salt and limestone which are available in abundant in the country. Soda ash is in short supply and is being imported from various countries. All imports are channelized through State Trading Corporation, a public sector undertaking. Growth of this industry exceeded in recent year because of high demand rates from the world's construction and automotive industries, especially those in China & other Asian Countries.

The scope for this product is very bright. Thus, a new entrepreneur can confidently venture into this project will find it a very lucrative.

***Cost Estimation:***

Capacity	:	500000 MT/Annum
Plant & Machinery	:	Rs. 30550 Lakhs
Cost of Project	:	Rs. 42100 Lakhs
Rate of Return	:	44%
Break Even Point	:	42%

**B-Naphthol Methyl Ethyl (Yara-Yara)**

Yara-Yara, chemical formula  $\text{C}_{10}\text{H}_7\text{OCH}_3$  is white having crystalline flakes. Chemically it is known as beta-naphthyl methyl ether or Z-methoxynaphthalene or methyl naphthyl ether. It is useful in the preparation of perfumery. It does not occur in nature but it is available as synthetic product being widely uses in manufacture of soap and Agarbattis. Perfumery today is based mainly on synthetics as against natural products in the past. Yara-Yara (Beta-Naphthyl Methyl ether) solubility one gram of material shall be clearly soluble in 25ml of ethanol. The material shall be packed in fiberboard boxes with polyethylene lined or lacquered metal containers. The material shall be protected from light and stored in cool place. Fragrance and flavours are segmented in the four categories viz Fragrance compositions, essential oil and other natural products and aroma chemicals. Current Indian perfumery and flavour business is estimated at around Rs 800 crores and an share is overall world market is at about 3 percent. Indian Perfume and flavour perfumes need to make quantum leaps in terms of cost reduction and quality improvement. Availability of diverse range of aroma chemicals indigenously at reasonable prices would go a long way in ensuring growth of Indian fragrances/flavours business.

***Cost Estimations:***

Plant Capacity	: 100.00 kg/Day
Plant & Machinery Cost	: Rs. 20 Lakhs
Total Capital Investment	: Rs. 65 Lakhs
Rate of Return	: 25%
Break Even Point	: 61%

**Caustic Soda**

Caustic Soda, also known as sodium hydroxide (NaOH), is an important industrial chemical produced on a tonnage basis in both solid and liquid form. It is deliquescent, absorbing water vapour and carbon-dioxide from the air. It is extremely corrosive and could be handled with great care. Adequate protection from body contact with the solid form or concentrated solution should be provided. Sodium hydroxide is probably the most widely used alkaline material in the chemical industry, as sulfuric acid is the most important acid.

***Cost Estimation***

Plant Capacity	: 30000 MT /Annum
Plant & Machinery	: 11.1 Corers
W.C. for 3 Months	: 9.225 Corers
Total Capital Investment	: 24 Corers
Rate of Return	: 55.65%
Break Even Point	: 53.16%

**Sodium Hypochlorite (Bleach Liquor)**

Prior to the development of chlorinated bleaches the process of bleaching textiles was a long and laborious one which required several months at a minimum and did not produce the high degree of whiteness to which we are accustomed today. Liquid bleach came into widespread use about 1930 for laundry, household and general disinfecting uses. Its preparation is a modification of Labarraque's method, the trend being toward lower residual alkali than was originally employed. This simplifies purification and sedimentation, while maintaining a PH of around 10.5 to 11 for stability. Liquid chlorine bleaches are sold as an alkaline solution containing 5.6% sodium Hypochlorite and are generally used at an available chlorine level of 200 PPM in wash. Bleach liquor demanded items in the society. The demand for this product is too high and also increasing day-by-day parallel to industrialisation. Presently about 30 units are in existence situated in different parts of the country.



***Cost Estimation:***

Plant Capacity	: 10 Ton/Day
Plant & Machinery Cost	: Rs. 34 Lakhs
Total Capital Investment	: Rs. 191 Lakhs
Rate of Return	: 21%
Break Even Point	: 53%

**Hydroxyl Amine Sulphate**

Hydroxylamine sulphate is one of the largely used natural salt hydroxyl amine sulphate is composed by hydrogen, nitrogen, oxygen and sulphur atoms. They are united proportionately and formed compound of hydroxylamine sulphate. It is used as reducing agent, Photographic developer, Purification agent for aldehydes and ketones, chemical synthesis, Textile chemical and etc. It is colourless crystals, solution has a corrosive action on the skin. It is soluble in water and slightly soluble in alcohol. There is only one or two organized manufacturer available in India. About 40% of the demand is fulfilled by import of this chemicals. There is wide gap between demand and supply. You can fill up this gap by install a new unit.

***Cost Estimation:***

Plant Capacity	: 1.0 MT/Day
Plant & Machinery	: Rs. 31.0 Lacs
W. C. for 3 Months	: Rs. 46.0 Lacs
Total Capital Investment	: Rs. 121 Lacs
Rate of Return	: 47.10%
Break Even Point	: 44.31%

**Methyl Acrylate**

Methyl acrylate is a compound of combination of Methyl Alcohol and acrylic acid. This compound contents carbon hydrogen and oxygen in proper proportion. The product is highly irritant and toxic to the body and skin. It is largely used as coating material, in acrylic polymers, amphoteric surfactant, vitamin B<sub>1</sub> and chemical intermediate. There are few organised sectors in India producing methyl acrylate. Mostly demand is fulfilled by import. The project is good and few more units can be started to fulfill the domestic demand.

***Cost Estimation:***

Plant Capacity	: 50 MT/Day
Plant & Machinery	: Rs. 1043 Lakhs
W. Cap. for 3 months	: Rs. 899 Lakhs
Total Capital Investment	: Rs. 2387 Lakhs
Rate of Return	: 42.14 %
Break Even Point	: 45.81 %

### Gold Potassium Cyanide

Gold Potassium Cyanide basically is a gold salt and it is generally made by using elements of potassium, gold, carbon and nitrogen. It is stable, colorless, crystalline compound and it is generally prepared from potassium cyanide and gold used as raw material. Basic plant and machineries required for the manufacturing of Gold Potassium Cyanides are reactor vessels, crystalliser, evaporator, filtration unit, centrifuge, drier etc. the basic advantage to install this plant and to manufacture this compound is that there is no requirement of importing any plant any plant and machineries as well as raw materials, because all the raw materials are available in India. Also, there is scope of importing of raw materials from outside India. Gold Potassium Cyanide is largely used in the gold plating on metallic plate. This is a good product and has fair market. Its demand also is increasing in an appreciable rate. Therefore it is a good area for new investment.

#### *Cost Estimation:*

Plant Capacity	: 250 Grm/Day
Plant & Machinery	: Rs. 13 Lakhs
W. Cap. For 3 Months	: Rs. 41 Lakhs
Total Capital Investment	: Rs. 75 Lakhs
Rate of Return	: 88.60%
Break Even Point	: 27.46%

### Ephidrine Hydro Chloride

Ephidrine hydro chloride is a crystalline product or powder. It is largely used in the manufacturing of asthmatic drugs. The manufacturing process involves highly environmental pollution. It can be industrially manufactured by maintaining every careful process parameters. It is manufactured by two stages of synthetic process, first preparing phenyl carbinol and then it is transformed to ephidrine hydrochloride. There are few organised companies engaged in the manufacturing of Ephidrine Hydro Chloride. Mostly 40 % of basic requirement is fulfilled in our country by importing of Ephidrine chloride from China. According to this, it can be predicted that there is a scope for few new entrepreneurs. But success of the product is totally depend upon the quality.

#### *Cost Estimation:*

Plant Capacity	: 500 Kgs/Day
Plant & Machinery	: Rs. 119 Lakhs
W.C. for 3 months	: Rs. 153 Lakhs
Total Capital Investment	: Rs. 401 Lakhs
Rate of Return	: 85.80 %
Break Even Point	: 33.43 %

### **Zeolite 4A**

Zeolite 4A is manufactured synthetically from zeolite A or NaA. It is products of pore openings by using calcium ions in the sodium zeolite. Zeolite 4A is used as an adsorbent for various gases, hydrocarbons etc. It is also used as an ion-exchanger. Their commercial utilization has been based on these unique properties. In India, there is good scope of zeolite 4A. Zeolite 4A manufacturers may come up with in short period due to the consciousness of air pollution. Air pollution can be come down by using 4A is adsorbent. The present demand for the product in the country is low. The demand is likely to pick up in the next few years.

#### ***Cost Estimation:***

Plant Capacity	:	2.0 MT/Day
Plant & M/c	:	Rs. 126 Lakhs
W. C. for 3 Months	:	Rs. 99.00 Lakhs
Total Capital Investment	:	Rs. 296.00 Lakhs
Rate of Return	:	61.88%
Break Even Point	:	44.17%

### **Bleaching Powder**

Bleaching process are those which remove colour from natural or artificial products. In early times bleaching was done by mechanical means and bleached goods were available only to rich people. Today, the bleaching to textile, paper and other materials constructed from the natural fibres is done largely by the chemical agents and are available to all. The development of bleaching powder was of tremendous importance to the textile industry and intact, to the economy and living standards of the entire world. According to available basic production data it can be assumed that there may be large demand supply gap, so new entrepreneur enter in this business will be successful.

#### ***Cost Estimation:***

Plant Capacity	:	5 MT/Day
Plant & Machinery	:	Rs. 34 Lakhs
W.C. for 3 Months	:	Rs. 14 Lakhs
Total Capital Investment	:	Rs. 75 Lakhs
Rate of Return	:	59.38 %
Break Even Point	:	40.74 %

### **Solid Carbon Dioxide-Dry Ice**

Dry ice is the name given to carbon dioxide when it is in a solid state. Carbon dioxide is found in the earth's atmosphere; it is a gas that humans exhale and plants use for photosynthesis. Carbon dioxide turns from gas to an

opaque white solid while under pressure and at low temperatures, turning solid at 9°F (178.5°C). Dry ice is manufactured primarily in two forms, either as a block of dry ice which weighs over 50 lb (22.7 kg) or in small pieces that vary in size from the size of a grain of rice to a larger pellet. Dry ice does not melt, instead it sublimates, meaning the solid turns directly into a gas (bypassing the liquid state) as the temperature rises and the solid begins to dissipate. This unusual feature results in a smoking effect, and dry ice appears to be steaming as it sublimates. Dry ice itself is not poisonous, but the surface of the solid is so cold that it should not be touched without gloves. Also, while the gas is stable and inert, it is heavier than air and can concentrate in low areas or enclosed spaces.

### Properties

The density of dry ice ranges from 1.4 to 1.6 grams per cubic centimeter. While the physical properties of dry ice and carbon dioxide gas are significantly different, their chemical properties tend to be similar. Dry ice normally exists in that solid physical state at significantly lower temperatures, any chemical reactions that carbon dioxide may normally undergo in the gaseous state can be severely inhibited in the solid state.

### Application

- ★ The most common use of dry ice is to preserve food, using non-cyclic refrigeration.
- ★ It is frequently used to package items that need to remain cold or frozen, such as ice cream or biological samples, without the use of mechanical cooling.
- ★ Dry ice can be used to flash freeze food, laboratory biological sample, carbonate beverages, and make ice cream.
- ★ Dry ice can be used to arrest and prevent insect activity in closed containers of grains and grain products, as it displaces oxygen, but does not alter the taste or quality of such foods. For the same reason, it can prevent or retard food oils and fats from becoming rancid.
- ★ It is used in fog machines, at theaters, discothèques, haunted house attractions, and nightclubs for dramatic effects. Unlike most artificial fog machines, in which fog rises like smoke, fog from dry ice hovers above the ground. Dry ice is useful in theater productions that require dense fog effects.
- ★ It is occasionally used to freeze and remove warts. Dry ice has the advantage of having fewer problems with storage, since it can be generated from compressed carbon dioxide gas as needed.

- ★ Dry ice blasting is used for cleaning a rubber mold. Dry ice can be used for loosening asphalt floor tiles or car sound deadening making it easy to dry off as well as freezing water in valve less pipes to enable repair.
- ★ One of the largest mechanical uses of dry ice is blast cleaning.
- ★ In laboratories, slurry of dry ice in an organic solvent is a useful freezing mixture for cold chemical reactions and for condensing solvents in rotary evaporators.
- ★ The process of altering cloud precipitation can be done with the use of dry ice.
- ★ Dry ice has the advantage of being relatively cheap and completely non-toxic. Its main drawback is the need to be delivered directly into the super cooled region of clouds being seeded.

### Market Scenario

The dry ice industry as a whole has greatly changed during the past few years with reorganizations and mergers. In most scenarios, dry ice represents one of the largest consumable costs for companies such as medical device suppliers, pharmaceutical companies, laboratories, and others that use dry ice in their day-to-day cold-chain operations. Demand for dry ice, which has traditionally been a seasonal item, has recently been shifting to being supplied by short distance transport by consumer's cooperative society (co-op) and courier services which are not affected by temperature or weather. This is considered to be part of the reason for the reduced rate of growth.

### *Cost Estimation:*

Capacity	:	1440 MT/Annum
Plant and Machinery	:	198 Lakhs
Cost of project	:	446 Lakhs
Rate of return	:	43%
Break Even Point	:	52%

## Chapter 13

### COLD STORAGE AND COLD CHAIN

#### Cold Chain

Cold chain has become one of the most important supply chain practices in the world today especially because it is used in the pharmaceutical, food, chemical as well as in the floral industries. Cold chain is a logistic system that provides a series of facilities for maintaining ideal storage conditions for perishables from the point of origin to the point of consumption in the food supply chain. The chain needs to start at the farm level (e.g. harvest methods, Pre cooling) and cover up to the consumer level or at least to the retail level. A well organized cold chain reduces spoilage, retains the quality of the harvested products and guarantees a cost efficient delivery to the consumer given adequate attention for customer service. The food supply chain is complex with perishable goods and numerous small stake holders. The Indian cold chains market is largely untapped and lined by several players in the unorganized sector which clues for immense investment and development opportunities. It is at a threshold of exponential increase due to developments taking place in food and retail industry of India.

#### Global Market

India has a huge opportunity to become a leading global food supplier if only it has the right marketing strategies and of course efficient supply & cold chains management. Retail is India's largest industry, accounting for over 10 per cent of the country's GDP. The businesses started with traditional corner stores and have emerged to supermarkets and modern retail stores. The total cold chain market in India is worth Rs. 21,375 million, which is equivalent to US\$ 475 million. Chiller Segment, which includes F & V pack houses, contributes Rs. 16050 million (US\$ 357 Million) to the cold chain market. The profile for the cold chain unit is created as per requirement of the 3rd / 4th years. Optimum utilization starts in 5th year. Being capital intensive project key indicators considered on the 15th year operation. There were 66,765 refrigerators and freezers installed and operational in the country. The cold chain equipment in the country has been installed based on population density of each district. Out of total 66,765 equipment, 63,726 (95%) were placed in 20 larger states and rest of 5% equipment was installed in smaller states and Union Territories.



Ministry of Food Processing Industries through its Scheme for Cold Chain, Value Addition and Preservation Infrastructure is promoting integrated cold chain projects in the country with an aim to provide integrated and complete cold chain and preservation infrastructure facilities without any break, from the farm gate to the consumer, enable linking of groups of producers to the processors and market through well equipped supply chain, establish value addition with infrastructural facilities like sorting, grading, packaging and processing for horticulture including organic produce, marine, dairy, poultry, etc. The cold chain industry itself is estimated to be as large as Rs. 10,000-15,000 crore, growing at 20-25 per cent and is expected to touch Rs. 40,000 crore by 2015.

***Cost estimation:***

Capacity	: 6050 T/A
Cost of the project	: 3771.14 Lakhs
Plant and machinery	: 1213.52 Lakhs
Internal rate of return	: 19.39%
Break Even Point	: 39.62%

**Cold Storage for Potatoes & Mahua**

India is the largest producer of fruits and second largest producer of vegetables in the world. In spite of that per capita availability of fruits and vegetables is quite low, because of post harvest losses, this accounts 25 to 30% of production. Besides, quality of a sizable quantity of produce also deteriorates by the time it reaches the consumers. This is the mainly because of perishable nature of the producer, which requires a cold chain arrangements to maintain the quality and extend the shelf life if consumption is not meant immediately after harvest. In the absence of a cold storage and related cold chain facilities, the farmers are being forced to sell their produce immediately and low price realization. To prevent the wastage of fruits and vegetables it is to require establishing a number of cold storage in different rural areas. Central as well as state governments are providing subsidy for setting up new cold storage.

A new entrepreneur can well venture in to this field by installing a project of cold storage to save the fruits and vegetables from wastage.

***Cost Estimation:***

Capacity	: 3000 MT/Annum Cap. 2000 MT Potatoes/Annum Cap. 1000 MT Mahua/Annum
Plant & Machinery	: 70 Lakhs
Total Capital Investment	: 170 Lakhs
Rate of Return	: 35%
Break Even Point	: 44%

## Chapter 14

### COMPUTER PRODUCTS AND INFORMATION TECHNOLOGY (IT) BASED

#### Information Technology (IT) Training Centre

Information technology (IT) is a rapidly changing industry, with constant hardware and software changes; the IT industry is highly volatile. The changes in technology and the adaptation of new technology by the industry had led to continuous change in manpower skills requirements. As a result, an individual needs to update himself regularly so as to be industry relevant. There is a very good prospect for IT training centres.

##### *Cost Estimation:*

Plant & Machinery	:	Rs. 18.45 Lakhs
W. C. For 3 Months	:	Rs. 18.71 Lakhs
Total Capital Investment	:	Rs. 47.27 Lakhs
Rate Of Return	:	29.29%
Break Even Point	:	72.54%

#### Online Shopping Mall

With an explosion of new web sites, almost anything for sale in shopping mall can be bought on internet at a faster speed and cheaper price. The speed, convenience and immediacy of e-commerce technology, coupled with entertaining shopping experience created on net, make shopping on line a thrilling experience. Online shopping malls strive to create are product or image into an entertaining experience. Online shopping malls are designed not only to provide consumer goods but also services and facilities such as entertainment; to satisfy the overall needs of the consumers. They usually have a on line departmental store and supermarket as their core stores and a large number of on line brand stores which are complemented by on line individual stores. The on line shopping mall concept in India is fairly new. This concept has been very successful all over the world. There is good project to new investment.

##### *Cost Estimation:*

Plant Capacity	:	400000 Transactions/Annum
Plant & Machinery	:	Rs. 10.0 Lakhs
Working Cap. for 3 Months	:	Rs. 8.9 Lakhs

Total Capital Investment	:	Rs. 34.7 Lakhs
Rate of Return	:	69.47%
Break Even Point	:	48.32%

### **Satellite Broadcasting T.V. Channel**

The Indian television business is packed with contradictions as of October 1999. On the one hand, it has some 70 million television homes, giving a viewing population of close to 400 million individuals. They have a gaggle-bag of 100 plus channels to choose from, but on the other hand, the infrastructure is so rickety that this choice cannot be converted into a willing purchase. On the one hand, Internet Service Providers are threatening to deliver the Net to Indian television viewers, while on the other 90% of Indian TV sets have the capability to receive only 12-16 channels. The authority makes a display of frowning down upon foreign broadcasters but allows them to operate freely in the country.

It has a glut of television channels, a slowing down advertising revenue stream, a gradual opening up of the pay television market, steady but unregulated growth in cable and satellite television homes and the absence of any machinery to track misdemeanours and crack down on violators. A broadcasting bill has been pending for almost four years, Ku-band DTH television has been stalled by vested interests, and cable TV licensing has not progressed and only a rudimentary Cable TV Network Regulation Act is what governs the massive cable TV operator community.

#### ***Cost Estimation:***

News Broadcasting	:	24 Hours/Day
Plant & Machinery	:	Rs. 324 Lakhs
W.C. for 3 Months	:	Rs. 653.64 Lakhs
Total Capital Investment	:	Rs. 1411.52 Lakhs
Rate of Return	:	67.84%
Break Even Point	:	41.26%

### **Computer Software**

The impressive growth of the Indian software industry has been possible for several reasons. India possesses the world's second largest pool of scientific manpower which also happens to be English speaking with the fact that the manpower costs are low. It provides India with an edge in the world market, but more importantly India has that inborn talent for software development. Also over the years the Indian Software Industry has built up a strong image in the international market. The Indian Software Industry is planning to reposition itself to achieve the exponential growth rates experienced by American Software Companies. It contemplates moving away from the image of supplier of cheap labour and recreating itself as provider of value added services.

***Cost Estimation:***

Plant Capacity	:	48 Software/Annum
Plant & Machinery	:	Rs. 40.0 Lakhs
W.C. for 3 Months	:	Rs. 22.73 Lakhs
Total Capital Investment	:	Rs. 92.73 Lakhs
Rate of Return	:	35.72%
Break Even Point	:	53.63%

**Computer Assembling Unit**

Computer is simply a tool for people to use; it is a machine that can solve any problem by accepting data, performing certain operations on that data and presenting result of those operations. Modern age is a computer age. The development of the computer in last couple of years particularly its national and international connectivity has increased its importance not only for professionals or researchers but also for all including housewives. Every year 2 to 3 lakhs computers are being produced in India. Many of the multinationals are also in Indian Market.

However, demand is expected to grow very rapidly and to reach to 25 lakhs numbers by 2004-2005. It is believed that the use of computer as communication will increase the demand for computers and revolutionise the world.

***Cost Estimation:***

Plant Capacity	:	1000 Nos./Annum
Plant & Machinery	:	Rs. 3.4 Lakhs
W.C. for 3 Months	:	Rs. 89.57 Lakhs
Total Capital Investment	:	Rs. 111.52 Lakhs
Rate of Return	:	37.68%
Break Even Point	:	39.12%

***Information***

- ★ One Lac / Lakh / Lakhs is equivalent to one hundred thousand (100,000)
- ★ One Crore is equivalent to Ten Million (10,000,000)
- ★ T.C.I. is Total Capital Investment
- ★ All costs/amount given in INR ₹
- ★ NPCS can provide customized Detailed Project Report on all the projects
- ★ Visit us at: [www.niir.org](http://www.niir.org) Email: [info@niir.org](mailto:info@niir.org)

## Chapter 15

## CONSTRUCTION & BUILDING MATERIALS

### Concrete Block & Ready Mix Concrete

Concrete is a composite construction material composed primarily of aggregate, cement and water. Concrete is widely used for making architectural structures, foundations, brick/block walls, pavements, bridges/overpasses, motorways/roads, runways, parking structures, dams, pools/reservoirs, pipes, footings for gates, fences and poles and even boats. Concrete blocks for building houses were first made in Europe around 1850. Ready mix concrete is a modern trend of introduction in the Asian Countries. It is already introduced long before in the European Countries. It is new concept of use concrete in the construction area. Ready mix concrete has advantages in the area where immediate requirement of concrete mixture like in the preparation of bridge overhead roads on or the road construction. In India there is a hope to get good scope of RMC within short period. There are plenty of raw materials and plant machineries in India indigenously.

### Applications

The concrete hollow blocks are used for building construction in developed countries. It takes less time in building work when concrete hollow blocks are used for building walls. Several bit of wall height can be constructed in a few hours in case of concrete hollow block walls compared with much slower rate of construction with conventional bricks. The second major advantage derived by the use of concrete hollow blocks is that the cavities in the blocks are filled with air column even after completion of the building work. The cavity filled in the concrete blocks makes it easy for prompt handling and higher in weight in comparison to the solid blocks of the same dimensions. Thus, workers engaged in building construction work feel less exhausted even after long stretch of work. It is used in the construction of bridge, dam overhead roads, pools, multi stories buildings etc.

### National Scenario

India is the second largest producer of cement in the world after China. It is followed by Japan and the USA. The overall turnover of the industry is



placed at Rs 600 bn. India accounts for a share of about 6% against China's 37% and the USA's 5% of global production. India is the second largest producer of cement in the world after China. It is followed by Japan and the USA. The overall turnover of the industry is placed at Rs 600 bn. India accounts for a share of about 6% against China's 37% and the USA's 5% of global production.

Cement and ready mix concrete demand is dependent on the level of construction activities. Construction activities are in turn closely related to a number of macroeconomic factors such as consumer spending, population growth, manufacturing sector growth, inflation rates, and government spending etc. The construction industry is the second largest industry in India after agriculture. It accounts for about 11% of India's GDP. Construction constitutes 40% to 50% of India's capital expenditure on projects in various sectors such as highways, roads, railways, energy, airports, irrigation etc. The growth of RMC (Ready Mix concrete) in India has in the past been predominantly driven by demand from the metro cities.

#### International Scenario

The world market for Ready Mix Concrete is projected to reach \$105.2 billion by the year 2015. This is primarily driven by rapid growth in infrastructure, residential sectors, and non residential sectors in various parts of the world. Further, the rapidly growing demand for the ready mix concrete in urban areas will also contribute to the market growth.

The demand of concrete block & ready mix concrete in the market is immense and therefore its market position is splendid. Hence it is an excellent field to venture.

#### *Cost Estimation:*

Capacity	:	2400000 No.s Concrete blocks / Annum, 49000 Cubic metre Ready mix concrete/Annum,
Plant and Machinery	:	1068 Lakhs
Cost of project	:	1477 Lakhs
Rate of return	:	44%
Break Even Point	:	42%

#### Cement Plant

Cement industry forms a vital part of infrastructure development since no modern construction activity can take place without the use of cement in one form or another. The term "cement" is used to designate many different kinds of substances that are used as binders. Cement used in construction is



characterized as hydraulic or non-hydraulic. The term cements as used henceforth will be confined to inorganic hydraulic cements, principally Portland cement.

India is the second-largest producer of cement in the world after China with industry capacity of approximately 160 MT in 2006. The cement industry is regional in nature due to the concentration of limestone reserves located in a few states. This has resulted in a surplus situation in some regions and a deficit in others. Demand for cement has grown at a CAGR of 9.1% in the last two years with supply growing at a CAGR of 8.2% in the same period. With a large amount of infrastructure activities being planned in commercial, real estate and housing sector along with huge development works in roads, railways, ports and hydel projects, we expect the cement demand growth momentum to stay intact.

Demand for cement is correlated to the GDP growth of the country, infrastructure and industrial capex as well as exports. Strong GDP growth expected in the coming years and huge planned investments should result in healthy growth in the cement demand. The Indian economy continues to be on a much stronger growth path driven by increased amount of infrastructure spending and capex. The economy is expected to grow by 8% for the next two to three years, which will drive an increased demand growth for the cement industry. The cement demand is expected to grow at a CAGR of 10% at least for the next three years.

The cement industry witnessed serious M&A activity in the past few years, as a result of which the top four players now account for almost 52-55% of the installed cement capacity of India. The M&A activity have also had global participants. The growing presence of international players bring with them better technology and operational efficiencies which could significantly alter pricing patterns. The industry blames the slide on persistent poor demand for the building commodity throughout the year. After the Commonwealth Games held in Delhi last October, demand worsened, pulling down production and sales on a year-on-year basis in subsequent months, the report said.

Cement demand is dependent on the level of construction activities. Construction activities are in turn closely related to a number of macroeconomic factors such as consumer spending, population growth, manufacturing sector growth, inflation rates, government spending etc.

The construction industry is the second largest industry in India after agriculture. It accounts for about 11% of India's GDP. It makes significant contribution to the national economy and provides employment to large number of people. Construction constitutes 40% to 50% of India's capital expenditure on projects in various sectors such as highways, roads, railways, energy, airports, irrigation etc. There are mainly three segments in the construction industry like real estate construction which includes residential and commercial

construction; infrastructure building which includes roads, railways, power etc; and industrial construction that consists of oil and gas refineries, pipelines, textiles etc. Building material is any material which is used for a construction purpose. Many naturally occurring substances, such as clay, sand, wood and rocks, even twigs and leaves have been used to construct buildings. Apart from naturally occurring materials, many man-made products are in use. According to a study by ASSOCHAM, the burgeoning Indian construction industry will rise in the coming years. A large and growing middle class population of more than 300 million people, a changing life style, better cost of living etc is growth drivers for this sector.

The cement industry has witnessed substantial reorganization of capacities during the last couple of years. Some examples of the consolidation witnessed during the recent past include: Gujarat Ambuja taking a stake of 14% in ACC; Gujarat Ambuja taking over DLF Cements and Modi Cement; India Cement taking over Raasi Cement and Sri Vishnu Cement; Grasim's acquisition of the cement business of L&T; Indian Rayon's cement division merging with Grasim; Grasim taking over Sri Digvijay Cements; L&T taking over Narmada Cements; ACC taking over IDCOL.

There is a very good scope and market potential of cement right now. New entrepreneurs should venture into this field.

#### ***Cost Estimation:***

Capacity	:	1800000 Nos. Cement Bags (50 Kg. each)
Plant & Machinery	:	1296 Lakhs
Cost of Project	:	1750 Lakhs
Rate of Return	:	42%
Break Even Point	:	47%

#### **Clinker Grinding for Cement**

The most commonly used cement in the world is Portland cement, which is formed at high temperatures that chemically combine the ingredients into new components, including calcium silicates and calcium aluminates. When the cement clinkers are ground with approximately 5% gypsum, they form Portland cement. These compounds allow cement to set when combined with water and to form strong bonds that can withstand pressure, water immersion, and other elements. In the manufacture of Portland cement, clinker is lumps or nodules, usually 3-25 mm in diameter, produced by sintering limestone and alumino-silicate during the cement kiln stage.

Cement clinkers are formed by the heat processing of cement elements in a kiln. Limestone, clay, bauxite, and iron ore sand in specific proportions are heated in a rotating kiln at 2,770° Fahrenheit (1,400° Celsius) until they begin to form cinder lumps, which are also known as cement clinkers. Cement

clinkers are usually ground with gypsum to produce the fine powder later mixed with liquid to produce cement, although some manufacturers ship cement clinkers in their lump form to cut down on dust. Cement is heavily relied upon to produce mortar, grouts, and concrete, and cement clinkers are the first stage, post firing, in making cement. Cement has strong bonding qualities when mixed with gypsum and water to form a hydration reaction, and it forms approximately one tenth of concrete, mixed with rocks, sand, and other materials and used in building construction all over the world. Concrete's high versatility makes it an ideal tool for building projects of all shapes and sizes, from skyscrapers to pool sides. Concrete can also be recycled when it has outlived its usefulness and converted back into cement clinkers through careful processing.

Clinker is ground (usually with the addition of a little gypsum, that is, calcium sulfate dehydrate) to become Portland cement. It may also be combined with other active ingredients or chemical admixtures to produce: ground granulated blast furnace slag cement, pozzolana cement & silica fume cement. The cement industry is one of the main beneficiaries of the infrastructure boom. With robust demand and adequate supply, the industry has bright future. The Indian Cement Industry with total capacity of 165 million tonnes is the second largest after China. Cement industry is dominated by 20 companies who account for over 70% of the market. Individually no company accounts for over 12% of the market. The major players like L & T and ACC have been quiet successful in narrowing the gap between demand and supply. Private housing sector is the major consumer of cement (53%) followed by the government infrastructure sector. Similarly northern and southern region consume around 20%-30% cement while the central and western region are consuming only 18%-16%.

India is the 2<sup>nd</sup> largest cement producer in world after china. Right from laying concrete bricks of economy to waving fly over's cement industry has shown and shows a great future. Domestic demand for cement has been increasing at a fast pace in India. Cement industry has contributed around 8% to the economic development of India. Outsiders (foreign players) eyeing India as a major market to invest in the form of either merger or FDI (Foreign Direct Investment). Cement industry has a long way to go as Indian economy is poised to grow because of being on verge of development. The company continues to emphasize on reduction of costs through enhanced productivity, reduction in energy costs and logistics expenses. The cement sector is expected to witness growth in line with the economic growth because of the strong co-relation with GDP. Future drivers of cement demand growth in India would be the road and housing projects. As per the Working Group report on Cement Industry for the formulation of the 11<sup>th</sup> Plan, the cement demand is likely to grow at 11.5 per cent per annum during the 11<sup>th</sup> Plan and cement production and capacity by the end of the 11<sup>th</sup> Plan are estimated to be 269 million tonnes and 298 million tonnes, respectively, with capacity utilization of 80 per cent.

There is a very good scope in this sector and new entrepreneurs should venture into this field.

***Cost Estimation:***

Capacity	:	1800000 Bags/Annum (each 50 Kg.)
Plant & Machinery	:	1296 Lakhs
Cost of Project	:	1750 Lakhs
Rate of Return	:	42%
Break Even Point	:	47%

**Ready-Mix Concrete**

Ready mix concrete is a modern trend of introduction in the Asian Countries. It is already introduced long before in the European Countries. It is new concept of use concrete in the construction area. Ready mix concrete has advantages in the area where immediate requirement of concrete mixture like in the preparation of bridge overhead roads on or the road construction. In India there is a hopeful to get good scope of RMC within short period.

The batching, mixing, transportation, placing, compaction, finishing and curing are very complimentary operations to obtain desired good quality concrete. The good quality concrete is a homogeneous mixture of water, cement, aggregates and other admixtures. Admixtures are chemical mixtures that are added to concrete to enhance its performance in some fashion. Admixtures are materials other than cement, aggregate and water that are added to concrete either before or during its mixing to alter its properties, such as workability, curing temperature range, set time or colour. Some admixtures have been in use for a very long time, such as calcium chloride to provide a cold-weather setting concrete. Others are more recent and represent an area of expanding possibilities for increased performance. Not all admixtures are economical to employ on a particular project. Also, some characteristics of concrete, such as low absorption, can be achieved simply by consistently adhering to high quality concreting practices. The aim of quality control is to ensure the production of concrete of uniform strength in such a way that there is a continuous supply of concrete delivered to the place of deposition, each batch of which is as nearly like the other batches as possible.

India is the second largest producer of cement in the world after China. Cement and ready-mix concrete demand is dependent on the level of construction activities. Construction activities are in turn closely related to a number of macroeconomic factors such as consumer spending, population growth, manufacturing sector growth, inflation rates, government spending etc.

The construction industry is the second largest industry in India after agriculture. It accounts for about 11% of India's GDP. It makes significant contribution to the national economy and provides employment to large number of people. Construction constitutes 40% to 50% of India's capital expenditure on projects in various sectors such as highways, roads, railways, energy, airports, irrigation etc. There are mainly three segments in the construction industry like real estate construction which includes residential and commercial construction; infrastructure building which includes roads, railways, power etc; and industrial construction that consists of oil and gas refineries, pipelines, textiles etc. Building material is any material which is used for a construction purpose. Many naturally occurring substances, such as clay, sand, wood and rocks, even twigs and leaves have been used to construct buildings. Apart from naturally occurring materials, many man-made products are in use. According to a study by ASSOCHAM, the burgeoning Indian construction industry, currently worth \$70 billion, will rise to US\$120 billion by 2010. The Ready-mix concrete business in India is in its nascent stage. In a developed country 70% of cement produced is used by the Ready-mix concrete industry. However, in India, the Ready-mix concrete industry uses less than 10% of the total cement production. A large and growing middle class population of more than 300 million people, a changing life style, better cost of living etc is growth drivers for this sector.

There is good scope to venture into this field for new entrepreneurs.

***Cost Estimation:***

Capacity	:	240 Cubic Meter/Day
Plant & Machinery	:	86 Lakhs
Total Capital Investment	:	936 Lakhs
Rate of Return	:	42%
Break Even Point	:	36%

**Artificial Sand from Stones and Waste Metals**

Sand is a naturally occurring granular material composed of finely divided rock and mineral particles. The composition of sand is highly variable, depending on the local rock sources and conditions, but the most common constituent of sand in inland continental settings and non tropical coastal settings is silica (silicon dioxide, or  $\text{SiO}_2$ ), usually in the form of quartz. Sand is generally mixed with cement and water form concrete. These sand particles should be hard and inert with respect to cement. In the construction industry commonly used artificial sand to compound concrete. Use of artificial sand concrete density, anti permeability, antifreeze performance is good, other physical and mechanical performance and long term durability all can reach the design requirements of operation. Artificial sand preparation is especially suitable for high strength grade of concrete, the high performance concrete and pumping concrete.

### Applications

Sand has its applications in various fields. In agriculture sandy soils are ideal for crops such as watermelons, peaches, and peanuts and their excellent drainage characteristics make them suitable for intensive dairy farming. In aquaria it makes a low cost aquarium base material which some believe is better than gravel for home use. Manufacturing plants add sand to a mixture of clay and other materials for manufacturing bricks. Coarse sand makes up as much as 75% of cob. Sand is mixed with cement and sometimes lime to be used in masonry construction. Sand is often a principal component of this critical construction material. Sand is the principal component in common glass. Mixing sand with paint produces a textured finish for walls and ceilings or non slip floor surfaces. Sand is also used as sand bags, these protect against floods and gunfire. Media filters use sand for filtering water.

### Global Demand

Due to the increase of population & living standards, the demand for this product is multiplying in every year. Present supply of production is meeting only about 20% of the demand if all the crusher units of the state start manufacturing machine made sand as an additional venture then also it could meet only about 50- 60% of the requirement. At present the existing sand manufacturers are producing sand like materials from granite stone and people are facing difficulties while plastering work. The demand of river sand will roll and will bring back the smiles on the faces of both the environmentalists and the industries. Because there is abundant of natural sand because of the heavy demand in the growing construction activities in nowadays society, the artificial sand production line the sand produce field has a popular and a welcome position.

The demand of sand in the market is immense and therefore its market position is splendid. Hence it is an excellent field to venture.

#### *Cost Estimation:*

Capacity	: 720000 MT/Annum
Plant and Machinery	: 585 Lakhs
Cost of the project	: 1066 Lakhs
Rate of return	: 44%
Break Even Point	: 51%

### **AAC Blocks (Autoclaved Aerated Concrete Blocks) Fly Ash Based**

Autoclaved Aerated Concrete (AAC) is a non-combustible, lime-based, cementitious building material that is expanding into new worldwide markets. As a single-component building material, AAC has achieved acceptance in new markets throughout the world.



AAC products are equally suitable for residential construction, multi-story buildings, commercial, and industrial construction. The products are made of natural materials: sand, lime, and water. These raw materials are processed to provide a building material with a large number of air-pores; hence, aerated concrete. Fine pores (nearly 70% of the product) and the solid structure of calcium silicate hydrate gives AAC its exceptional material properties.

The AAC has the features of light bulk density, good thermal insulation properties and sound-absorption, certain strength and process ability, and its raw materials is very rich, especially the reuse of fly ash enables the comprehensive utilization of industrial residue, curbs environmental pollution, no destroy on farmland, create good social and economic benefits. AAC is an ideal alternative of the traditional clay brick wall materials. For many years AAC has been strongly supported by national wall reform policy, tax policy and environmental policy. In a sentence, AAC has been an important factor in new building materials and has a broad market prospect. New entrepreneurs should venture into this field.

***Cost Estimation:***

Capacity	:	150000 m <sup>3</sup> /Annum
Plant & Machinery	:	1100 Lakhs
Cost of Project	:	1790 Lakhs
Rate of Return	:	44%
Break Even Point	:	53%

**Pre-Tensioned Prestressed Railway Sleepers**

A railroad tie (generally known as a railway sleeper) is a rectangular object used as a base for railroad tracks. Ties are members generally laid transverse to the rails, on which the rails are supported and fixed, to transfer the loads from rails to the ballast and sub grade, and to hold the rails to the correct gauge.

Traditionally, ties have been made of wood, but concrete is now widely used. Steel ties and plastic composite ties are currently used as well, although far less than wood or concrete ties. As of January 2008, the approximate market share, in North America, for traditional and wood ties was 91.5%, whereas the approximate combined market share for all concrete, steel, adobe (exotic hardwood) and plastic composite ties was 8.5%.

Ties are normally laid on top of track ballast, which supports and holds them in place, and provides drainage and flexibility. Heavy crushed stone is the normal material for the ballast, but on lines with lower speeds and weight, sand, gravel, and even ash from the fires of coal-fired steam locomotives have been used.

Approximately 3000 ties are used per mile of railroad track. The rails are traditionally joined to the track by a railroad spike rather than the substantial iron/steel chairs used in Europe.

Concrete ties have become more common mainly due to greater economy and better support of the rails under high speed and heavy traffic. As concrete technology developed in the 19th century, concrete established its place as a versatile building material and could be adapted to meet the requirements of railway industry.

Prestressed concrete is basically concrete in which internal stresses of a suitable magnitude and distribution are introduced so that the stresses resulting from external loads are counteracted to a desired degree. In reinforced steel concrete members, the prestressing is commonly introduced by tensioning the steel reinforcement.

India's infrastructure spending at present, accounts for just 4 per cent of GDP as compared to China's 9 per cent. Physical infrastructure covering transportation, power and communication through its backward and forward linkages facilitates growth; social infrastructure including water supply, sanitation, sewage disposal, education and health, which are in the nature of primary services, has a direct impact on the quality of life. The feasibility of infrastructure projects in ports, roads, airports and railways with private-sector majority ownership is already evident. The government also expects a substantial increase in the share of private sector investments in infrastructure from 19 per cent in the Tenth Plan to around 30 per cent in the Eleventh Plan. The biggest increase in private participation is expected in roads (from 5 per cent to 36), ports (47 per cent to 74 per cent) and railways (less than 1 per cent to 20 per cent). The Planning Commission estimates that the remaining infrastructure investments will be funded by the central and state government.

Thus there is a good scope to venture into this field for new entrepreneurs.

***Cost Estimation:***

Capacity	: 300000 Nos./Annum
Plant and Machinery	: 182 Lakhs
Cost of Project	: 466 Lakhs
Rate of Return	: 44%
Break Even Point	: 52%

**Artificial Granite Tiles**

Artificial marble or granite having excellent aesthetic properties, patterns and tonalities cannot be found in natural materials. The artificial granite solid material has an excellent machinability, workability, and physical properties (strength), as well as good-looking textures (inorganic material like appearance, expressing by itself heaviness, hardness, and thickness; exhibits a very granitic look as a whole) with an ornamental and luxurious appearance.

Granite was recently rated the top performing kitchen countertop material by a leading consumer magazine when compared with engineered stone (an excellent countertop material), butcher block, ceramic tile, stainless steel and other manufactured surfaces. It is also more hygienic (tied with quartz) than all other surfaces. One of the hardest and strongest materials in nature, granite originated from the earth's core as liquid magma. Extreme heat and pressure forged the quartz, mica, feldspar and other minerals into a very dense structure millions of years ago. Additional heat and pressure resulted in the myriad, fascinating combinations of colour and pattern as well as the many outstanding qualities of our granite.

Marketability of artificial granite tiles is mostly governed by its aesthetic properties, which cannot be subjected to quantitative measurements. The aesthetic properties include colour, pattern, surface appearance, texture, and workmanship. Granite Slab and Tiles are mainly used for wall paneling and facades.

Artificial granite tiles are used for facing flooring and wall skirting in domestic and commercial building including hotels and community buildings, so the consumption of granite slab and tiles is pre dominant in diversified end-user industries and as a consequence, there invariably exist a great demand-supply gap which will need to be filled up. Hence a new entrepreneur will ever find this trade a profitable.

The construction industry is the second largest industry in India after agriculture. It accounts for about 11% of India's GDP. Construction constitutes 40% to 50% of India's capital expenditure on projects in various sectors such as highways, roads, railways, energy, airports, irrigation etc. There are mainly three segments in the construction industry like real estate construction which includes residential and commercial construction; infrastructure building which includes roads, railways, power etc; and industrial construction that consists of oil and gas refineries, pipelines, textiles etc. Many naturally occurring substances, such as clay, sand, wood and rocks, even twigs and leaves have been used to construct buildings. Apart from naturally occurring materials, many man-made products are in use.

The Commonwealth Games - 2010 in New Delhi have thrown mega opportunities for Building Material Companies, Construction Equipments & Technologies companies. The Govt. of India has permitted FDI up to 100% for development of integrated townships in India last year. India is now the second most favoured destination for FDI, behind China. A large and growing middle class population of more than 300 million people, a changing life style, better cost of living etc is growth drivers for this sector.

There is a good opportunity and scope for new players to venture into this field.

***Cost Estimation:***

Capacity	:	656700 Sq. Ft/Annum
Plant and Machinery	:	148 Lakhs
Cost of Project	:	342 Lakhs
Rate of Return	:	42%
Break Even Point	:	55%

**Precast Concrete Compound Wall**

Precast boundary walls are a by-product of other primary needs: protection, privacy or both. Putting up a designer fence or wall enables us to define our boundaries, keep children and/or dogs in or out and protect an area. Yet in addition to serving its purpose, fences today can offer beautiful detail and aesthetic appeal. Pre cast boundary walls when most people consider building a fence; the first thing that comes to mind is probably not a concrete fence. Pre cast boundary walls are superior to wood, wrought iron, vinyl, brick, block and stucco in most every way. Nothing outlasts it in either mild or severe climates. While other materials rapidly deteriorate in extremes of weather, environment and temperature, a precast concrete fence endures with little maintenance.

Precast boundary walls has been used as both commercial and residential designer fencing. Benefits of precast Compound Wall are quality assured by structural engineers, cost-effective, fastest Installation, re-Installable, economical compared to conventional products, ready in a single day, no labour needed, easily erected, less space is required, plastering not required, can shift the wall easily from one place to another, more essential than bricks wall, can decorate it in different shape and colours.

There will be phenomenal growth in precast industry in the near future. Transportation of large precast sections and handling at site has posed a problem in India. Now there is considerable improvement in the quality of roads (riding surface) and also availability of high capacity handling equipment in most metros, this industry will also flourish. There is good scope for precast concrete compound wall. New entrepreneurs venture into this field will be successful, because this is a totally new concept in India.

***Cost Estimation:***

Capacity	:	36000 Sq. mtr/Annum
Plant & Machinery	:	55 Lakhs
Cost of Project	:	172 Lakhs
Rate of Return	:	43%
Break Even Point	:	57%

### Ceramic Wall and Floor Tiles

The tile is a manufactured piece of hard wearing material such as ceramic, stone, metal, or even glass. Tiles are generally used for covering roofs, floors, walls, showers, or other objects such as tabletops. Alternatively, tile can sometimes refer to similar units made from lightweight materials used for wall and ceiling applications. Ceramic glazed tiles are made of porous body with a coating of white or coloured glaze. These are used extensively in the Bathrooms, Kitchen in modern buildings and in Hospitals and Analytical Laboratories, Toiletries attached to Railway platforms. This is because of this products have properties like good resistance to weather and chemicals, having high strength hard, glossy surface with different colours and pleasing appearance. In the near future the chances for replacing these items by other materials look very bleak. These tiles are rather cheap, easy to clean have more life and are available in pleasing colours. The ceramic tiles industry is large, rapid, growing and populated by organized and unorganized manufacturers. Over the last few years, industry prospects were subdued on account of an oversupply and increasing imports. The industry can be classified into three key segments, viz., wall tiles, floor tiles and segment on account of durability, utility, maintenance and better appearance with premium pricing and higher realisation. In the international markets these tiles are already major sellers. Ceramic tiles today have become an integral part of home improvement. It can make a huge difference to the way your interiors and outdoors look and express.

There exists a very good opportunity and ample scope to venture into this field for new entrepreneurs.

#### *Cost Estimation:*

Capacity	:	120000 Sq. Mt/Annum Wall Tiles & 90000 Sq. Mt/Annum Floor Tiles
Plant & Machinery	:	542 Lakhs
Cost of Project	:	1020 Lakhs
Rate of Return	:	43%
Break Even Point	:	59%

## Chapter 16

### COPPER AND ITS PRODUCTS

#### Copper Rod Casting, Wire Drawing and Enamelling

Copper wire is an essential material for electrical cables, motors and transformer winding. Copper wire is available in different gauges. The gauge of the copper wire depends upon the winding required for the specific motor or transformer. There is huge demand of copper wire in electrical industry such as in motor and transformer manufacturing and rewinding. On the basis of high conductivity, strength and ductility copper wire are adopted as the best known economical material for such applications.

As a result of increasing demand and wide applications numbers of new units have been established and existing units have undergone expansions and for increasing productions in order to cater the ever growing demand. However, the demand of copper conductor wire is so high in India that despite a fair increase in installed capacity and actual productions of units, import is continuing. Thus, there is a good potential for new entrepreneurs.

#### *Cost Estimation:*

Capacity	:	5300 MT/Annum
Plant & Machinery	:	190 Lakhs
Cost of Project	:	1126 Lakhs
Rate of Return	:	45%
Break Even Point	:	53%

#### Copper Wire Drawing

#### (From Higher Size to Very Thin Size Used In Electrical Cables)

Copper wire is an essential material for electrical cables and motor and transformer winding. Copper wire is available in different gauges (42 gauges to 18 gauges). The gauge of the copper wire depends upon the winding required for the specific motor or transformer.

There is a heavy market for copper wire in motor and transformer manufacture and the copper is also used in rewinding of motors and transformers. Whatever the motor may be the winding of copper wire is done.



On the basis of high conductivity, strength and ductility, copper wires are adopted as the best known economical material for such purposes. Copper is used mainly in the electrical industry for manufacturing parts of electrical apparatus, bus bars, wire etc. Copper is not very ductile at temperature from 250 to 6000C and cannot be forged or stamped at temperatures above 6000C, due to its high brittleness. Pure copper is very seldom forged or stamped and usually only its alloys bronze and brass are subjected to forging and pressing.

Wire is made by cold drawing hot-rolled wire/rod through one or more dies, to decrease its size and increase the physical properties. The wire rod about 7/32" (6mm) in diameter is rolled from a single billet and cleaned in an acid bath to remove scale rust and coating. The coating is applied to prevent oxidation, neutralize any remaining acid and to act as a lubricant or a coating to which a later applied lubricant may cling.

There is a very good scope for this product and new entrepreneurs should venture into this field.

***Cost Estimation:***

Capacity	:	150 MT/Annum
Plant & Machinery	:	69 Lakhs
Total Capital Investment	:	167 Lakhs
Rate of Return	:	45%
Break Even Point	:	42%

***Information***

- ★ One Lac / Lakh / Lakhs is equivalent to one hundred thousand (100,000)
- ★ One Crore is equivalent to Ten Million (10,000,000)
- ★ T.C.I. is Total Capital Investment
- ★ All costs/amount given in INR ₹
- ★ NPCS can provide customized Detailed Project Report on all the projects
- ★ Visit us at: [www.nir.org](http://www.nir.org) Email : [info@nir.org](mailto:info@nir.org)

## Chapter 17

## COSMETICS AND PERFUMERY COMPOUNDS

### Perfumery Chemicals (Synthetic & Natural)

Perfumery chemicals are largely utilised in the production of different type of aromatic product like powder, cream, nail polishes, after shave lotions, toothpaste, soap, detergent, Agarbatti, different variety of perfumes etc.. There are lot of synthetic perfumery compounds of which Isobutyl acetate, Amyl benzoate, Butyl Phenyl Acetate, Ethyl Butyrate etc. Perfumery chemicals are divided in two parts (1) Natural perfumery compound and (2) Synthetic perfumery compound. Both are largely demanded compound. Natural perfumery compound are basically highly volatile compounds. The demand of these chemicals is increasing day by day. There is good scope for new entrepreneur to invest in this project.

#### *Cost Estimation:*

Plant Capacity	:	100 Kg/Day
Plant & Machinery	:	Rs. 6.4 Lakhs
Working Cap. for 3 Months	:	Rs. 13.6 Lakhs
Total Cap. Investment	:	Rs. 39.3 Lakhs
Rate of Return	:	50.07%
Break Even Point	:	54.86%

### Aromatic Perfumery Compound

A perfume can be defined as a blend of odorous materials of natural and synthetic origin which gives a pleasant odour impression. The art of perfumery is of extreme antiquity. The perfumes have been used from time immemorial and have played an important part in daily life of the people. The application of cheap synthetic perfumes in the manufacture of soaps, cosmetics and confectionary, etc. induced Indian perfumes to import and methods of production could not compete with the modern scientific equipments and process. Therefore, improvements in the existing equipments and process are to be introduced early to develop the present state of perfumery industry in the country. While the number of natural and synthetic perfumery chemicals are limited that of possible complexes are very large. Modern perfumes are developed to satisfy varied tastes. Aromatic perfumery compound are quite

cheap and also produce stable perfumes and hence are highly popular. They are very widely used particularly. Perfumes like Fancy and Royal bouquet are used in Agarbatti to impart scent in it. The formulation considered here for Fancy perfumes can also be considered for it has application in flavouring foods. It produces strong fruity odour suggestive of peach. The formulation considered for Royal bouquet can also be used for flavouring foods. It provides a light, balsamic odour reminiscent of almost and a Sharps pungent taste. The flourishing position which India has to olden times and medieval periods dwindled down due to the lack of scientific knowledge and inability of Indian manufacturers to adopt themselves to the modern advancements in science and equipments. The introduction of cheap aromatic chemicals and perfumes, having odours similar to the natural perfumery essential oils, further decreased Indian exports. This is the reason that these perfumery compounds are getting more popularity with the increase in population as well as inclination of people towards aestheticism has greatly influenced the business trend of the perfumery compound. The consumption of these bouquets like perfumery compounds is increasing day by day as the production of fancy and Royal bouquet like perfumery compounds is quite profitable. It is a very good project, so new entrepreneur may enter in this field,

***Cost Estimations:***

Plant Capacity	: 10 kg/Day
Plant & M/c	: 6 Lakhs
Cost of Project	: 51 Lakhs
Rate of Return	: 30%
Break Even Point	: 52%

**Talcum Powder and Compact Powder for Face**

Talcum powder is naturally available as magnesium silicate of monohydrate. It is largely used in the cosmetic and soap industries. It is also known as soap stone. For making face powder it should be non toxic to the skin. This is not only used by women but men also like to apply talcum powder or some specially compounded powder to the face. Compact powder also made by using starch, starch derivatives. Especially cosmetics and normal cosmetics items are used largely in the different section of the community. Now in our country there is market demand increase by 5% per annum. As a whole any new entrepreneur comes in this type of production will have to face the competition in the market. There is a very good scope for new entrepreneurs.

***Cost Estimations:***

Plant Capacity	: 3000 MT/ANNUM
Plant & M/c	: 31 Lacs
Cost of Project	: 81 Lacs
Rate of Return	: 36%
Break Even Point	: 60%

### **Hair Dye Henna Based (Black, Burgundy, Chasetnut & Special Brown Colours)**

Henna leaves are abundantly used for making different types of colours. It has natural properties to produce colours and that characteristics are used in the cosmetic industries. Henna leaves have property to react with different variety of colours. Henna powder is fully herbal product. It is basically used in hair for decorating the hair by making different colour. Exploring of the natural resources is one of the main works in our hair dye. It is largely demand items in the society especially in the festival season, there is gap for manufactures to produce quality products for export purpose.

#### ***Cost Estimations:***

Plant Capacity	: 7500.00 Kg/Annum
Plant & Machinery Cost	: Rs. 5 Lakhs
Total Capital Investment	: Rs. 28 Lakhs
Rate of Return	: 42%
Break Even Point	: 50%

### **Light & Fragrant Hair Oil with Coconut Oil & Mineral Oil**

Hair oil of one type or another has a popular appeal for men and women throughout the world. Today they are used in the most exclusive beauty saloons and by the primitive tribes of Africa. The hair oil segment has different segment-coconut hair oil segment, premium hair oils and the perfumed heavy hair oils. The coconut hair oil (66% of hair oil market) has an approximate market size of around 80 mn litres. In the perfumed hair oil market 'Amla' forms the main component and the leading brands are Dabur Amla & Bajaj Sevashram. The Premium hair oil market includes the value added ones like Dabur Vatika and Marico's Parachute Herbal, Parachute Lite and Hair and Care.

Coconut oil or coconut based oil is very popular and very preferred as hair oil worldwide. Coconut oil contains lauric acid and when converted into monolaurin, provides the antimicrobial and antifungal properties of the oil. Coconut oil is also found in shampoo, conditioner and soap ingredients. The monolaurin is an antifungal agent, thus, it could help fight the growth of *Malassezia globosa* that can cause dandruff. Oils mineral origins are also used in the making of hair oils. The most commonly known of them is the white oil. The oils are very thin but its use in hair oil making is very restricted as this is directly injurious to the hairs.

Whether its skin issues, hair problems or health crises, coconut oil is the best answer. It has been associated with multitude of applications, right from food and medicine to industry. It can be also used as a natural health food, cooking oil, bio fuel, toothpaste etc.

Coconut is a versatile crop grown all over the world. India is leading producers accounting for three – fourth of global output. Coconut oil and copra are the two major products shaping the global economy. India has unbeatable quality advantage in this sector. There is good international as well as domestic demand. New entrepreneur enter in this project will be successful.

***Cost Estimation:***

Capacity	:	800 MT/Annum (Light & Fragrant Hair Oil)
Plant & Capacity	:	37 Lakhs
Total Capital Investment	:	347 Lakhs
Rate of Return	:	46%
Break Even Point	:	36%

***Information***

- ★ One Lac / Lakh / Lakhs is equivalent to one hundred thousand (100,000)
- ★ One Crore is equivalent to Ten Million (10,000,000)
- ★ T.C.I. is Total Capital Investment
- ★ All costs/amount given in INR ₹
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### Thermoforming Plant for Manufacturing of Disposable Glass, Bowls & Plates

Cost film, thermoforming film and sheet are manufactured continuously on extrusion lines with short dies. Depending on the thickness and subsequent conversion process, the plastic products are wound in web form or stacked in thermoforming film or sheet.

Thermoforming films are chiefly manufactured on extrusion lines especially developed for the purpose. For that, two different plant systems are used - Off-line production and In-line production.

The demand for those films with improved properties has lately increased. Thermoforming cups, dishes and plates are most useful in the all sphere of domestic life. It is also used to take food material instantly. It is largely used in hotels, dhaba, restaurant and the other sellers who sell their product instantly. Nowadays it has very good market demand. It has a good scope for new entrepreneur.

#### *Cost Estimation:*

Plant Capacity	:	32000 No.s/Day
Plant & Machinery	:	Rs. 52.75 Lakhs
Total Capital Investment	:	Rs. 115.88 Lakhs
Rate of Return	:	12.40 %
Break Even Point	:	74.13 %

### Disposable Paper Plate

Disposable cutlery and containers are products that are a part of our day to day life. Disposable items like cups, plates, saucers are being increasingly used. Such disposables items are made with easily degradable materials which are manmade products like paper from wood pulp, biomass etc. Paper cups and plates have greater hygiene value. Cost-wise also it is cheaper than plastics and other plates. It has good demand in urban areas.



Disposable paper products are inexpensive, lighter in weight and convenient to use. These products which mimic certain properties of conventional ones are suitable for all types of hot or cold, liquid and solid food items. Disposable paper dinnerware products are environment-friendly solutions as well. Nowadays, they are available in biodegradable, recyclable and compostable forms which bring minimum damage to the ecosystem.

Hygiene and sanitation are the other important factors that make people go for disposable dinnerware. They follow simple 'use and throw' method. Many of the catering businesses and restaurants have now greatly benefited from these products. They help in easy clean up and there is no chance of breakage.

Disposable paper plate making is a state-of-the-art to develop biodegradable and compostable alternatives to petrochemical based plastics and polystyrene. Disposable paper plate products are biodegradable, disposable, hygienic and inexpensive alternatives to conventional paper, plastic or reusable (metal, ceramic, plastic) plates and bowls. Developed in India, paper plate products have been used for many years for serving dry or moist foods at roadside food stalls or small restaurants in rural or urban areas, and at large gatherings such as weddings and receptions. If they are used for dry foods, the paper plates can be reused.

Paper plate products can be made from a variety of partly dried biomass derived from trees and plants, e.g., Areca or Manila palm spathe, disposable Paper and its pseudo-stem, and leaves of Butea frondosa, Tectona grandis, Butea monosperma, and Madhuca indica among others that are common to the tropical areas of Asia, Africa, Central and South America.

Disposable Paper plates are best described as a revolutionary product and are strong just like the ordinary pulp paper plates and are made from natural, bio-degradable product. These Paper plates are popular among those who appreciate the concept of using a natural plate material in an original and organic way.

Future prospects and market demand also depends upon new create of design with high calibrating graphic communicate and in competence in technical know-how of paper plates and their production technology.

There is a good scope for new entrepreneurs to venture into this field.

***Cost Estimation:***

Capacity	:	60000000 Pcs./Annum
Plant and Machinery	:	4 Lakhs
Total Capital Investment	:	91 Lakhs
Rate of Return	:	53%
Break Even Point	:	38%

### **Disposable Plates from Banana Leaves**

Disposable cutlery and containers are products that are a part of our day to day life. Disposable items like cups, plates, saucers are being increasingly used. Such disposable items are made with natural materials like leaf as well as manmade products like paper, plastics. Leaf cups, plates have greater hygiene value.

Banana leaf plate making is a state of the art to develop biodegradable and compostable alternatives to petrochemical based plastics and polystyrene. Banana leaf plates is best described as a revolutionary product and is strong just like the ordinary pulp paper plates and are made from natural, biodegradable product. These leaf plates are popular among those who appreciate the concept of using natural plate materials in an original and organic way.

The banana leaf plates can be manufactured with the best quality leaves and are distinct in style. These are the perfect pieces used for serving any occasion, party, gatherings or grand party. These plates can be easily disposed and are environment friendly. Environment friendly products helps to keep the environment clean and make the planet good to live.

Presently most of the disposable containers are made from plastics and paper. But the use of plastics is either discouraged or banned because the cause environmental pollution. Hence, banana leaves as an alternative material, offers great usage and health environment. These plates are itself very strong, and hot, cold, heavy and sloppy food is easily coped with. These are great for parties and barbeques. In future, the demand of Disposable Plates from Banana Leaves will increase day by day. There is good scope to venture into this project for new entrepreneurs.

#### ***Cost Estimation:***

Capacity	:	9000000 Nos./Annum Disposable Plates from Banana Leaves
Plant & Machinery	:	6.5 Lakhs
Total Capital Investment	:	34 Lakhs
Rate of Return	:	51%
Break Even Point	:	48%

### **Sanitary Napkins**

Sanitary Napkins are one of the items of non-woven textile. It may come under speciality textile group. According to industry observers, India's health care industry is expected to grow around 13 % per annum. The product has very good export potentiality. The export of sanitary napkin has been increased 15% within a span of ten years. The export of sanitary napkins from India were made to as many as 37 countries which includes countries like USA,

Italy, France, Japan, Canada, Australia, Sweden, Germany and Middle East etc. Domestic demand is also increasing day by day. New entrepreneurs venture in to the project can get very good market.

***Cost Estimation:***

Plant Capacity	: 80000 Pcs/Day
Plant & Machinery	: Rs. 31.21 Lacs
W. Cap. For 3 Months	: Rs. 29.95 Lacs
Total Capital Investment	: Rs. 100.11 Lacs
Rate of Return	: 34.93%
Break Even Point	: 50.99%

***Information***

- ★ One Lac / Lakh / Lakhs is equivalent to one hundred thousand (100,000)
- ★ One Crore is equivalent to Ten Million (10,000,000)
- ★ T.C.I. is Total Capital Investment
- ★ All costs/amount given in INR ₹
- ★ NPCS can provide customized Detailed Project Report on all the projects
- ★ Visit us at: [www.nir.org](http://www.nir.org) Email: [info@nir.org](mailto:info@nir.org)

## Chapter 19

### EDIBLE OILS AND NON EDIBLE OILS

#### Refined Oil (Cotton Seed Oil, Ground Nut Oil & Sunflower Oil)

Vegetable oils are obtained from oil seeds, tree crop or seed from the seed of annually grower crops. They include most of the fatty acids esters of glycerol, commonly called triglycerides which provide the world with its supplies of edible oils and fats. The fats and oils are respectively solid and liquid at ambient temperature. The term 'Vegetable Oils' and 'Edible Oils' are synonymous in the Indian context because in this country fats of animal origin such as fish oil and lard are not used as cooking media's nevertheless, Edible oils are a major source of nutrition. The fatty acids in edible oils are required by the body as a vehicle for carrying vitamins, and they provide energy which is twice that of the cereals. The edible oils and fats such as olive, cottonseed, corn, groundnut, soyabean etc. have been found to be almost completely assimilated. As such vegetable oils may be classed as edible and non-edible, important vegetable oils are castor, coconut, cottonseed, line seed, mustard, soyabeans, sunflower, ground nut and rice bran oil etc.

#### Application

Edible oils have different applications dependent on their type:

- ★ Large quantities of vegetable oils are also used in industrial applications such as Soaps industry, Paints, varnishes and enamels industry and miscellaneous industries like lubricants, plastic, nylon, cosmetics, leather tanning, wool, pesticides, medical preparations etc.
- ★ Cottonseed oil is used primarily as such or in a hydrogenated form for edible purposes.
- ★ Cottonseed oil has many food applications. As a salad oil, it is used in mayonnaise, salad dressings, sauces, and marinades. As cooking oil, it is used for frying in both commercial and home cooking.
- ★ Sunflower oil is used as a lubricant, for lighting purposes and treatment of shoddy in woolen manufacture.

- ★ Sunflower oil is used as cooking and salad oil, for the manufacture of margarine, shortening and other edible products, in bakery goods, for packing sardines, and as a base for certain pharmaceuticals.
- ★ Groundnut oil is most commonly used when frying foods, particularly French fries and chicken.
- ★ Groundnut oil can also be used to make soap in a process called saponification.

### Indian Scenario

The demand for edible oils in India has shown a steady growth at a CAGR of 4.43% over the period from 2001 to 2011. The growth has been driven by improvement in per capita consumption, which in turn is attributable to rising income levels and living standards. In terms of volumes, palm oil, soyabean oil and mustard oil are the three largest consumed edible oils in India, with respective shares of 46%, 16% and 14% in total oil consumption in 2010. The Indian edible oil market is the world's fourth-largest after the USA, China and Brazil. A growing population, increasing rate of consumption and increasing per capita income are accelerating the demand for edible oil in India. India is a leading player in edible oils, being the world's largest importer and the world's third-largest consumer. Each year, India consumes over 10 million tons of edible oils. Edible oils have a high penetration of 90% in India.

Since the applications and demand of refined oil is immense therefore the potential of the product is excellent. It is one of the imperative fields to endeavour.

### *Cost Estimation:*

Refined oil	
Capacity	: 30000MT/Annum, Refined oil, of which 10000 MT/Annum, Cotton seed oil, 10000 MT/ Annum, groundnut oil 10000 MT/Annum, sunflower oil
Plant and Machinery	: 922 Lakhs
Cost of project	: 2185 Lakhs
Rate of return	: 46%
Break Even Point	: 57%
Oil Seed Extraction	

### Rice Bran Oil

Rice bran is the most important source of edible oil among the unconventional sources. Rice bran is the brown coating around the white starchy rice kernel, which is obtained by de husking paddy and polishing the rice. Despite the

impressive growth of rice bran technology in the country, only a third of the available potential has been exploited. Rice is not only the oldest cultivated crop but also a basic food of more people than any other cereal grain. Rice bran contains 18-20% edible oil 35% sugars, varieties of B vitamins and 0.51% rice wax. Rice Bran Oil is truly "The World's Healthiest" edible oil, containing vitamins, antioxidants, nutrients and trans fat free. It's not just delicate and flavourful, it can help lower cholesterol, fight diseases, enhance the immune system, fight free radicals and more. Rice Bran Oil is extremely light, versatile and delicious. Use it to fry, sauté, in salad dressings, baking, dipping oils and where ever you use cooking oil.

### Applications

- ★ Bran oil is used in the soap industry and to a limited extent refined to edible oil while the defatted bran meal is employed as an animal feed.
- ★ Rice bran wax is an important by product of rice bran oil industry. Rice bran wax can be used in the preparation candles, polishes, cosmetics, emulsifiers, and other industrial preparations.
- ★ With the results in a good balance of plasticity, creaminess, and spreading properties, making it is ideal oil for bakery shortenings & Margarine.
- ★ The paddy and content of rice bran oil increases due to the action of a lipase present in the bran. Inactivation of lipase would lead to good quality oil.

### Global Demand

India produces about 80 million tonnes of paddy annually. This can yield about 5 million tonnes of rice bran and to the extent of 8 lakhs tonnes of rice bran oil. Rice bran oil alone has the potentiality of wiping out a large part of the deficit oil in the country. India is the second largest producer of rice in the world next to China, having potential to produce about 12 lakh tonnes of Rice Bran Oil per annum. Currently the industry is processing about 35 lakh tonnes of Rice Bran Producing about 8.0 lakh tonnes of Refined Rice Bran Oil per annum, out of which 5.5 lakh tonnes is edible grade and the balance 0.5 lakh is of non edible grade. Edible oil is an item of mass consumption and any rise in its price is mass politically sensitive. Since imports of oil seeds is considered to hit the interest of the farmers, the government has to import the finished product of the industry that is edible oil, in order to bridge the gap between demand and supply. It has made a remarkable development and at present 2,50,000 tons or one quarter of the yearly output of rice bran in this country are turned into nearly 50,000 tons of rice bran oil a year by some 70 plants scattered throughout the country. Rice bran oil industry is contributing to economization of foreign exchange amounting to about Rs. 20 million every year.



Since the applications and demand of rice bran oil is immense therefore the potential of the product is excellent. It is one of the imperative fields to endeavour.

***Cost Estimation:***

Capacity	:	5100 MT/Annum, Refined rice bran oil 24900MT/Annum, De oiled rice bran oil cake (byproduct)
Plant and Machinery	:	757 Lakhs
Cost of project	:	1243 Lakhs
Rate of return	:	45%
Break Even Point	:	50%

**Cotton Seed Delinting, Dehulling and Oil Extraction**

Cotton plant is cultivated mainly for fibre and its seed are a rich source of protein and edible oil. Cottonseed oil has many applications varying from medicinal to technical purposes. The other uses are for cosmetic creams, glycerol, lubricants, soap stocks, etc. The oil cake can be used as animal feed, filler for plastics & fertilizer ingredient.

India is one of the largest producer of oil seeds and oil bearing materials and both edible and non-edible oil in the world. Cottonseed oil is cooking oil extracted from the seeds of cotton plant of various species, mainly *Gossypium hirsutum* and *Gossypium herbaceum*. Cotton grown for oil extraction is one of the big four genetically modified crops grown around the world, next to soy, corn, and rapeseed (canola).

The cottonseed has a similar structure to other oilseeds such as sunflower seed, having an oil bearing kernel surrounded by a hard outer hull; in processing, the oil is extracted from the kernel. Cottonseed oil is used for salad oil, mayonnaise, salad dressing, and similar products because of its flavour stability. The cottonseed oil undergoes intensive treatment after extraction to reduce the level of gossypol found in untreated cottonseed oil, the consumption of which may produce undesirable side-effects.

Its fatty acid profile generally consists of 70% unsaturated fatty acids including 18% monounsaturated (oleic), 52% polyunsaturated (linoleic) and 26% saturated (primarily palmitic and stearic).

Cottonseed oil is described by scientists as being "naturally hydrogenated" because the saturated fatty acids it contains are the natural oleic, palmitic, and stearic acids. These fatty acids make it stable frying oil without the need for additional processing or the formation of trans fatty acids. Cotton seed oil is not required to be as fully hydrogenated for many purposes as some of the more polyunsaturated oils. On partial hydrogenation, the amounts of monounsaturated fatty acids actually increase. When hydrogenated to a typical

iodine value of about 80, for example, its fatty acid profile shifts to 50% monounsaturated, 21% polyunsaturated, and 29% saturated, which are all well within current diet/health guidelines. Cottonseed oil resists rancidity and therefore offers a longer shelf life for food products in which it is an ingredient. Refined cottonseed oil, which contains practically no gossypol, is pale yellow in colour and can be used directly as a cooking medium.

Among the agro-based industries, oil seeds crushing and vanaspati industry forms a major group employing 0.5 million persons. Cottonseed crushing industry has made continuous progress in the country. The growing shortage of other edible oils in the country during the sixties and seventies gave a greater impetus to increased use of cottonseed for oil extraction. Special mention may be made of the incentives given by Government by way of (i) excise rebate on cottonseed oil used for vanaspati manufacture, (ii) specifying that a minimum level of cottonseed oil should be used in vanaspati manufacturing and (iii) subsidy for export of cottonseed meal after extraction of oil. The All-India Cottonseed Crushers' Association, formed in 1959, has also played a major role in increasing utilization of cottonseed oil.

There is an ample space and very good scope for cottonseed oil. New entrepreneurs should venture into this field.

#### *Cost Estimation:*

Capacity	:	8100 MT Cotton Seed Oil/Annum 21150 MT Cotton Seed Cake/Annum 6750 MT Cotton Seed Lints/Annum
Plant & Machinery	:	483 Lakhs
Cost of Project	:	978 Lakhs
Rate of Return	:	45%
Break Even Point	:	60%

#### **Vegetable Crude Oil (Solvent Extraction Plant)**

Vegetable oils are daily necessities used in all over the world and different types of oilseeds are grown everywhere. Besides serving as a food purpose, vegetable oils are also the source of biodiesel, the new environmental friendly fuel.

India is one of the largest producers of oilseeds in the world and this sector occupies an important position in the agricultural economy. Oilseeds and edible oils are two of the most sensitive essential commodities. India grows oilseeds on an area of over 28 million hectares, with productivity of around 1000 kg a hectare. But self-reliance in edible oils is not in sight and the country imports almost half of its edible oil requirements.

India has a wide range of oilseeds crops grown in its different agro climatic zones. Groundnut, mustard, rapeseed, sesame, safflower, linseed, castor are the major traditionally cultivated oilseeds. Soyabean and sunflower have also assumed importance in recent years. Coconut is most important

amongst the plantation crops. Among the non-conventional oils, rice bran oil and cottonseed oil are the most important.

India has relatively lower yields on the back of growing oil seeds in marginal and sub marginal lands under low input usage. To bridge the gap between demand and supply, country is compelled to import a large quantity of edible oils. India has become the largest importer of vegetable oils in the world. Imports are taking place in two forms-refined and crude oil. A large part of the crude oil gets sold as unbranded oil. The share of raw oil, refined oil and vanaspati in the total edible oil market is estimated at 35%, 55% and 10% respectively. The domestic turnover of the vegetable oil industry is Rs 10,0000 crore and import-export turnover of about Rs. 40000 crore per annum, consisting of Rs. 27000 crore for import of vegetable oils & Rs. 13000 crore for export of oil meals, oilseeds, castor oil, groundnut oil & vegetable fats of tree borne oilseeds.

The global production of 10 major oilseeds is estimated at around 430 million tonnes for 2009-10 and big supply pressure ahead for Soyabean and soya meal from March, the analyst said vegetable oil demand (food and non-food) is set to exceed production again this year with bio-fuel output set to accelerate. The sunflower oil prices is rising steeply by \$120-150 a tonne from current values.

India may overtake China as the world's top importer of vegetable oil, and growth in the two nations' consumption will drive global demand for palm and soybean oil. Controls and regulations by government have left the edible oil industry in a highly competitive market dominated by both domestic and multinational players. It is the right time for an entrepreneur to venture into this sector which is highly profitable.

#### *Cost Estimation:*

Capacity	:	20 Lakh Tin (Cap. 15 Kg.) Soyabean Oil 96000 MT Soyabean Meal Cake/Year
Plant & Machinery	:	472 Lakhs
Cost of Project	:	1276 Lakhs
Rate of Return	:	46%
Break Even Point	:	54%

#### **Solvent Extraction Plant for Rice Bran**

Rice has been and continues to be the largest source of human nutrition. Rice bran is a by-product of the rice milling process. Rice bran is the most important source of edible oil among the unconventional sources. Rice bran is the brown coating around the white starchy rice kernel, which is obtained by dehusking paddy and polishing the rice. While white rice holds little nutritional value, the bran that is removed contains 65 percent of the rice kernel's nutrients and boasts a bounty of healthful benefits. The thin brown layer that

is milled off in the processing of white rice, rice bran is just as effective as the other bran's in fighting high cholesterol and providing high-grade fiber.

India produces about 80 million tonnes of paddy annually. This can yield about 5 million tonnes of rice bran and to the extent of 8 lakhs tonnes of rice bran oil. Production of rice bran oil is currently estimated at about 2 lakhs tonnes and hardly 10-15 per cent of it is of edible grade, although the potential availability is reckoned at about 8 lakhs tonnes. The wide gap between the actual production and the potential availability of rice bran oil is primarily due to the fact that at present around 70 per cent of the paddy produced in the country is processed through huller mills while only 30 percent is processed by modern sheller mills. It has been estimated that huller mills number about 80,000 while there are only 28,000 modern sheller mills.

Rice bran oil is natural oil that is created using the hull or bran of the rice grain. One of the advantages of using rice bran oil in cooking is that the oil has a high smoking point. This means the oil is ideal for frying foods without running the risk of overheating and burning the food before the meat or coated vegetables are cooked all the way through.

The creation of rice bran oil involves the pressing of the hull or bran of the rice grain. By pressing on the hull, small amounts of oil can be extracted and collected. The oil released from the rice bran contains a hefty amount of Vitamin E, gamma oryzanol and the essential fatty acids that lend a great deal of taste to the oil. The presence of a number of antioxidants also help to make rice bran oil a healthier alternative for use in salad dressings and as an ingredient in baked goods.

Rice Bran Oil alone has the potentiality of wiping out a large part of the deficit oil in the country. India is the biggest producer of rice in the world, next to China. However only a very small proportion of the rice bran is processed and large quantity of oil in rice bran is wasted.

According to the solvent Extractor's Association of India, the total production of oil from indigenous sources amounted to 73.2 lakhs tonnes in oil year 2003-2004 and in the current oil year this is expected to rise to around 80.6 lakhs tonnes. The government estimated that the total shortfall in supply was of the order of about 6 lakhs to 7 lakhs tonnes. However, it imported about 11 lakhs tonnes last year, which is expected to go up to about 15 lakhs tonnes in the current year. The government is importing just the double of its own stated shortfall. There is an ample of scope and space for new entrepreneurs to venture into this field.

***Cost Estimation:***

Capacity	: 8100 MT/Annum
Plant & Machinery	: 486 Lakhs
Cost of Project	: 804 Lakhs
Rate of Return	: 42%
Break Even Point	: 54%

## Chapter 20

### EDUCATIONAL INSTITUTES

#### Marine Engineering College

"The direction in which education starts a man will determine his future life". A good degree course module recognizes the wisdom in what was stated by the great philosopher hundreds of year ago.

Marine Engineering is a branch of Engineering that deals with nautical Architecture and Science. The term 'Marine Engineering' is meant for research conducted in oceans and coastal or inland waters connected to the sea. One of the most interesting things about marine engineering is that people working in this field get to experiment with all kinds of new technologies such as hydrodynamics, super conductivity and fuel cells in order to upgrade the water vessels. Marine Engineers have the complete responsibility of the ship technical management. They are responsible for selecting the ships machinery and for the design of mechanical, electrical, fluid and control system throughout the vessel. They are the members of a ship's crew who are in charge for managing a team of marine technicians and crafts people.

Marine engineer have a number of job opportunities on shore as well. Many international companies are willing to recruit fresh graduates in the field. They offer them training along with generous compensations that makes it a great career line. There are plenty of job opportunities in France & the U.K. as well. The very nature of the job fascinates many youngsters to take Marine Engineering as their career.

Three quarters of the earth's surface is surrounded by water and for that reason itself Marine Engineering is a very exciting and challenging field for those who are passionate about sea and are fond of working with tools. Even though waterways are comparatively used less for travelling, about 80% of the good transportation happens through sea. For international export and import of freights, countries mainly depend on ships and other water vessels. Marine Engineering is the most basic profession as far as ships and navigation is concerned.

There is good scope for establishment of new marine college.

***Cost Estimation:***

Capacity	:	B.E. Marine Engg.-4 Years B.Sc. Nautical Bsc.-3 Years 40+60 = 100 Students Per Year Classes Avg. 216 Days in Year
Plant & Machinery	:	685 Lakhs
Total Capital Investment	:	1840 Lakhs
Rate of Return	:	38%
Break Even Point	:	45%

**CBSE Primary School**

The Central Board of Secondary Education (abbreviated CBSE) is a Board of Education for public and private schools, under the Union Government of India. CBSE affiliates all Kendriya Vidyalayas, all Jawahar Navodaya Vidyalayas, private schools, and most of the schools approved by central government of India. The Central Board of Secondary Education (CBSE) is contemplating extending grading system till class VIII. The system is already in place in Delhi schools up till class V. CBSE Board has decided to introduce "Seven points grading systems" & has asked for the opinion of various school in the regard. But the process is still in the planning stage and all options are being weighed. This model would be based on the absolute model of grading, which would also be "differential" for different subjects and based on a "non uniform" bandwidth. Some schools have also reiterated the need for training of teachers to grade if the system is implemented after the primary level.

**Norms and Standards to be Fulfilled by Every School**

- (i) Pupil teacher ratios at primary and upper primary level
- (ii) building norms to provide for all weather building, barrier free access, separate toilets for boys and girls, safe drinking water, kitchen facility, play ground, etc.
- (iii) minimum number of working days
- (iv) minimum number of working hours per week per teacher
- (v) teacher learning equipment
- (vi) Library
- (vii) Play material, games and sports equipment.

**Educational System in Indian Market**

India is predominantly a higher education market, approximately 70 per cent postgraduate, and 30 per cent undergraduate. While the further education



market is still relatively small, there is potential for growth, as there is a greater need for skills in a more service sector led economy. CBSE Schools are present all over India because of the increasing demands and need for quality education. Therefore, it has become significant for the schools to get the affiliation from CBSE Board to get listed in the top schools of the country. The focus is on the broad dimensions and magnitude of the structure, organization and progress in education. Further it also highlights growth and priority areas in education in India that point to the challenges of the future. There are about 888 thousands educational institutions in the country with an enrolment of about 179 millions. Elementary Education System in India is the second largest in the World with 149.4 million children of 6-14 years enrolled and 2.9 million teachers. This is about 82% of the children in the age group.

CBSE is a self financing body that takes into consideration the needs and requirements of the affiliated schools. CBSE (Central Board of Secondary Education) affiliation is the most popular school examination board. One can start with a primary school and later take CBSE affiliation for class 8th onwards. But, establishing a CBSE school from the very beginning guarantees a quality education and full support of the CBSE Board.

***Cost Estimation:***

Capacity	:	800Students/Annum
Plant and Machinery	:	193 Lakhs
Total Capital Investment	:	818 Lakhs
Rate of return	:	37%
Break Even Point	:	36%

**Dental College**

Dental education occupies a place of pride in the field of medical studies. The basic aim of the dental colleges is to provide health-oriented courses that emphasize the prevention of oral diseases. In a human body mouth is considered to be the mirror dental health being intimately related is part and parcel of the general health and well being of an individual. With increasing awareness in oral health and surge in the demand for cosmetic dental care together with technological advances in delivery of dental care, need for trained professionals in this field is ever increasing. As dentistry offers a satisfying, rewarding and lucrative career, it has become the subject of choice for aspiring professionals of tomorrow. Dentists are doing a great job today. Right from fulfilling the basic needs of restoration and prosthesis of common man, they are designing smiles of models, actors and others who want to enhance their confidence. They are doing well both in the public and the private sector. But with time their number is increasing and so is the competition amongst them. There is now a dire need of these professionals to explore new areas and widen their scope of employment.

### **Importance of Dental Health**

Dental Health is very important to everyone. It refers to all aspects of the health and functioning of our mouth especially the teeth and gums. Teeth and gums should be free from infection, which can cause dental caries, inflammation of gums, tooth loss and bad breath. Dental caries is also known as the "tooth decay" or "cavities". It is the most common disorder affecting the teeth. Dental hygiene is the most vital part of dental care. Primarily, it is essential to the health of your mouth, which can assist you in evading excruciating infections. Too many cavities can be hazardous, and those cavities that transform into boil can lead to even worse troubles such as root canals or teeth extraction. Secondly, good dental hygiene is essential cosmetically too. Thus maintaining a good dental hygiene is of utmost importance.

### **Dental Education in India**

India has more than 250 dental institutions, producing 15,000 to 20,000 BDS graduates every year. For all statistical purposes, this figure along with the existing dental practitioners apparently fulfills the World Health Organization requirement of dentist to population ratio. It is, however, unfortunate to note that there are many places in our country devoid of dental clinics, major dental hospitals or dental institutions. In India, the cost of both dental education and setting up of dental clinics is very high. This makes the young graduates opt for setting up their clinic in a bigger town or a metropolitan city to get back their investment. This mal-distribution of dentists results in overcrowding of dental practice in big towns and dentist-free state in many villages. Government and the Dental Council of India (DCI) can formulate policies in such a way that new dental institutions are encouraged in rural areas or places with no provision for public dental healthcare. A dental college offers post-graduate (M.D.S.) programme in nine disciplines i.e. Prosthodontics, Oral Surgery, Orthodontics, Conservative Dentistry, Oral Pathology, Periodontics, Community Health Dentistry, Oral Medicine and Pedodontics.

### **Market Scenario**

Healthcare delivery is estimated to grow at a 12 per cent CAGR during 2010-11 and 2015-16 whereas healthcare delivery industry estimated at Rs 2.3 trillion in 2010-11. India's medical education market (both dental and medical) in 2009-10 is Rs. 21 billion which grew by a CAGR about 10% in last three years. Indian medical education market is to grow at a CAGR of 18% by 2012-13 to attain a market size of Rs. 35 billion. In order to achieve the 1:1,000 doctor-patient ratio and 1:7,500 dentist-to-population ratio, as recommended by the World Health Organisation (WHO), India needs at least 600,000 doctors, 200,000 dental surgeons and one million nurses. Against this the country produces only 23,000 new doctors, 13,000 dental doctors

and 45,000 nurses every year. Therefore a huge demand supply gap exists in medical education. In India, the growing awareness of the role of health development as a vital component of socio-economic development, has contributed to the increase in number of medical and dental colleges.

In the past ten years, the total number of colleges (Medical & Dental) increased to 572 in 2008-09 from just 324 colleges in 2000-01, registering a growth of 65%. In spite of the continuous growth in the medical education sector over the past few years, the country has not been able to meet the growing needs for medical professionals in the country. Therefore the medical and dental education market in India offers an excellent investment opportunity.

***Cost Estimation:***

Capacity	:	100 Students/Annum in Dental College with Hospital
Plant and Machinery	:	674 Lakhs
Total capital Investment	:	1598 Lakhs
Rate of return	:	47%
Break Even Point	:	45%

**Medical College with Hospital**

The growth of medical education institutions especially in the private sector in India shows that the rapid growth in the number of medical colleges in India since 1950 has been driven largely by developments in the private sector. The private sector, currently accounting for over 45% of medical colleges in India, grew by 900% between 1970 and 2004, with the bulk of this growth occurring in the richer states. The growth of the private medical education sector over the last 5 decades is the most dominant feature of the Indian medical education landscape.

The demand for medical professionals is tremendously increasing with the unfortunate upsurge of diseases and ailments day by day. At the same time super specialty hospitals are coming up both within the country and abroad offering employment opportunities. These along with liberalization of economy could bring better opportunities for these professionals in terms of remuneration, research and working facilities.

Healthcare undoubtedly is one of the pillars of social sector reforms in India. Ensuring right to food, health and education to all citizens has been the prime objective of our government since independence. Good health implies ensuring right to life which is universally acclaimed fundamental human right under the 1948 Human Rights Declaration of the United Nations.

The healthcare industry in the country, which comprises hospital and allied sectors, is projected to grow 23 per cent per annum to touch US\$ 77 billion by 2012 from the current estimated size of US\$ 35 billion, according

to a Yes Bank and an industry body report published in November 2009. The sector has registered a growth of 9.3 per cent between 2000-2009, comparable to the sectoral growth rate of other emerging economies such as China, Brazil and Mexico. According to the report, the growth in the sector would be driven by healthcare facilities, private and public sectors, medical diagnostic and pathlabs and the medical insurance sector.

Hospitals in India have a very bright future. India is the largest democracy in the world, is one of the fastest growing economies that is projected to more than double in the next five years.

New entrepreneurs should venture into this field.

***Cost Estimation:***

Capacity	:	100 Students in College 500 Beds in Hospital
Cost of Project	:	1729 Lakhs
Total Capital Investment	:	7958 Lakhs
Rate of Return	:	55%
Break Even Point	:	49%

***Information***

- ★ One Lac / Lakh / Lakhs is equivalent to one hundred thousand (100,000)
- ★ One Crore is equivalent to Ten Million (10,000,000)
- ★ T.C.I. is Total Capital Investment
- ★ All costs/amount given in INR ₹
- ★ NPCS can provide customized Detailed Project Report on all the projects
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### **Lead Acid Battery**

The lead-acid storage battery, an important energy storage device, is the most widely used secondary storage cell by automobile and other industries. Storage cells are devices which release a flow of electron through an external circuit as a result of reactions occurring between the active electrode materials and ions transported by the electrolyte. The cells in which the reactions are reversible are called secondary cells. In these cells the active materials can be returned to their original state by applying electrical current from an external source in the opposite direction to the flow of the cells discharge current. We are dependent on lead-acid batteries for many uses in our lives that can be subdivided into four broad categories: engine-starting, motive power and standby power, valve-regulated battery. There are two distinct designs of recombination battery currently use: Absorbed electrolyte and Gelled electrolyte. Lead acid battery industry is divided into three main sectors: SLI batteries, industrial batteries and transaction batteries. SLI batteries are primarily used in motor vehicle. Industrial batteries include those used for uninterrupted power supply and transaction batteries are used to power electric vehicles such as forklifts.

### **Characteristics**

The lead battery uses lead oxide as the active material of the positive electrode and metallic lead in a high surface area porous structure, as the negative material. The physical and chemical properties of these materials are listed below:

- ★ Typically a charged positive electrode contains both variations,  $\beta$ - $\text{PbO}_2$  (Orthorhombic) and  $\alpha$ - $\text{PbO}_2$  (Tetragonal)
- ★ The equilibrium potential of the  $\alpha$ - $\text{PbO}_2$  is more positive than that of  $\beta$ - $\text{PbO}_2$  by 0.01V.
- ★ The cured plate consists of lead sulphate, lead oxide and some residual lead (d'5%).

- ★ The electrolyte is a sulfuric acid solution, about 1.28 specific gravity or 37% acid by weight in a fully charged condition.
- ★ As the cell discharges, both electrodes are converted to lead sulfate and the process reverses on charge.

### Application

The lead-acid battery is used in a wide variety of applications, and in the past few years many new applications have arisen:

- ★ The most common use of the lead-acid battery is for starting, lighting, and ignition in automobiles and other vehicles with internal combustion engines.
- ★ Lead-acid batteries are used as the power source in off-the-road vehicles such as golf carts, forklift trucks, mining vehicles, and construction and industrial equipment.
- ★ It also has applications in DC Power System which includes a battery charger (rectifier/charger) which has a sufficient capacity to recharge the batteries at the proper voltage while simultaneously supplying power to the dc load.
- ★ In Static uninterruptible AC Power System (UPS) a storage battery is linked to the utility power to provide a continuity of service in the event of an interruption of the utility power.
- ★ Valve-regulated batteries are used for standby applications such as in telephonic systems, uninterruptible power systems, burglar, fire alarms and emergency lighting.

### Global Scenario

Lead acid batteries are considered to have one of the fastest global growth rates. Usage of lead acid battery is expected to grow further with technological advancements in the electric vehicles market. Although efforts are on to develop a "miracle battery" for electric vehicles, lead acid batteries are one of the few battery technologies that are considered as the workhorses of today's Electric Vehicle fleet. The influx of cutting edge technology has brought forth a new genre of long lasting, lead acid batteries featuring smaller size and lightweight attributes. The global market for Lead Acid Batteries (Automotive) is forecast to reach US\$15.4 billion by the year 2015, charged by sustained demand from automobiles industry, specifically the aftermarket/ replacement market. Emergence of next-generation electric vehicles (EVs) and hybrid electric vehicles (HEVs) will further drive the market.

Since there is a huge demand for Lead acid battery in market therefore the entrepreneur venturing in this field expects an enormous success.



***Cost Estimation:***

Capacity	:	300000 Nos./Annum
Plant and Machinery	:	416 Lakhs
Cost of project	:	1327 Lakhs
Rate of return	:	44%
Break Even Point	:	56%

**Electric Energy Meter**

An electricity meter or energy meter is a device that measures the amount of electric energy consumed by a residence, business, or an electrically powered device. Electricity meters are typically calibrated in billing units, the most common one being the kilowatt hour. A periodic reading of electric meters establishes billing cycles and energy used during a cycle. In settings when energy savings during certain periods are desired, meters may measure demand, the maximum use of power in some interval. In some areas the electric rates are higher during certain times of day, reflecting the higher cost of power resources during peak demand time periods. Also, in some areas meters have relays to turn off nonessential equipment. Implementing an electronic energy meter, can be as simple and inexpensive as using a single dedicated energy measurement IC (MCP3905) and a display/counter of choice. However, more advanced solutions are possible when adopting an 8 or 16 bit microcontroller (MCU), or even a 16 bit Digital Signal Controller (DSC).

**Parts of a Meter**

**TIMEKEEPING:** One category of power meters is required to log multi rate energy usage, to track the energy consumed and the time of day so the power companies can bill correctly. Multi rate meters must record this switching from one rate to another very accurately. Keeping track of the electricity used, employing some form of timekeeping in electronic meters is required.

**ELECTRICITY METER SENSORS:** Electricity meters measure current (amperes) and voltage (volts) and calculate the product of these values to determine electrical power (watts). There are two common methods for sensing the amount of current flowing in a wire.

- ★ The first method uses a shunt resistor to directly measure the amount of current, while
- ★ The second method uses an isolation transformer that indirectly measures current through the secondary winding.

### Applications

Energy meters are devices that measure production, supply, and consumption of energy (electricity) at residences and commercial establishments. These meters include electromechanical meters and solid state meters. Energy meters are coil based devices wherein rotation of coil advances reading in meter & thereby determining the energy usage. Electricity meters provide a measurement of the number of kilowatt hours that have been consumed by a customer. To encourage more efficient use of electricity, utility companies would also like to measure the power factor of the load, and time of electricity consumption, among other things. Light dimmers, refrigerators, washing machines and dryers and HVAC, to name a few, provide a significant nonlinear load to the meter.

### Global Demand

India is also rapidly becoming a big exporter of energy meters with changing technology in its products. According to an international study, the total market for energy meters in the world is a round 40 million pieces with India's share at 5.2 million (13%). Every house, small factory, business establishment, shops, offices etc. need at least one energy meter to register power consumption. Energy meters are a typical instrument to measure the amount of electricity or energy consumed by a user. It has been traditionally present in the market with the dominant types being the electromagnetic and static ones. However the market is steadily moving towards a newer generation meters which include smart and digital meters. Increasing government support in the sector as regards to the electrification activities is driving the market. This same survey shows that seven states have achieved more than 15 percent market penetration: Arizona, Oregon, Idaho, Pennsylvania, Wisconsin, California and Missouri.

Since there is a huge demand for electric energy meter in market therefore the entrepreneur venturing in this field expects an enormous success.

#### *Cost Estimation:*

Capacity	: 150000 No.s/Annum
Plant and Machinery	: 32 Lakhs
Cost of project	: 170 Lakhs
Rate of return	: 42%
Break Even Point	: 68%

### Electric Motor

Electric equipment industry contributes over 2% of GDP which is projected to increase to about 12% in 2015 according to a study by Frost & Sullivan. During the period, consumption of electrical equipment is estimated to increase

from over USD 28 bn now to USD 363 bn, growing at a CAGR of about 30%. It is also expected that during 2010-2015, the Indian equipment manufacturing will grow at 5.5 times the growth rate of global electronic equipment production.

An electric motor or a synchronous motor is a type of alternating current motor where power is supplied to the rotor by means of electromagnetic induction. Induction motors are now the preferred choice for industrial motors due to their rugged construction, absence of brushes and the ability to control the speed of the motor. Production of induction motors is the main indicator of growth in demand for drive equipment. Induction motors are even coming back in the area of usages requiring speed control because of the new electronic control systems available capable of giving soft start, smooth speed control through invertors. DC motors are, therefore no supreme in the field.

The demand of electric motor is increasing day by day due to its multipurpose uses. So, any entrepreneur can venture in this field will get success.

#### *Cost Estimation:*

Capacity	:	60000 Nos./Annum
Plant & Machinery	:	137 Lakhs
Cost of Project	:	472 Lakhs
Rate of Return	:	42%
Break Even Point	:	60%

#### **Set Top Box**

The digital television is considered to be the future of modern television and for that reason there are laws coming in near future that require all the TV stations to switch from analog broadcast to digital. TV viewing is undergoing a change in India with the implementation of Conditional Access System (CAS) and availability of Direct to Home (DTH) services.

Digital transmission is superior because it converts images and sounds into digital computer data and transmits them. Once the digital data is received by the receiver attached to your television, it is then quickly reassembled into the original picture and sound and viewed by the viewer. Though this may seem like a longer procedure of transmitting television data, it actually is more advantageous than the older analog method as it provides you with a better picture and sound quality. The picture is not grainy or disturbed and the transmission is very clear. This is because the digital tuner attached to the receiver removes any interface from the signals before converting them back to the original images and sounds.

This ability to clean the interface from the signals results in superior quality of picture and sound which ultimately results into superior quality viewing. To add to the quality, the digital television has another advantage of having

a user friendly interface where the user can view the listings well in advance rather than having to flip through random channels to find out what's on and what's not. One of the other benefits of digital TV is that the transmission can be compressed in order to take up less bandwidth. This implies that more number of channels can be transmitted over the same cable or over the air frequency. This is beneficial for the cable operators who wish to increase the number of channels, as they can now do so without having to replace any cable. HDTV has a bandwidth hogging nature, and hence digital TV transmission is a better way of transmitting HDTV regardless of the medium of transmission used.

India is a dynamic study in itself. The Indian scenario is potentially exciting with a series of decisions taken by the Government to regulate the Indian DTH scene. But the initial excitement in Nov. 2000 has largely been transformed by a realistic look at the guidelines for DTH service in India. The Set Top Box (STB) market growth in India can also be attributed to the growing implementation of CAS (conditional access system), DTH (direct to home) services. The DTH subscriber base has grown to 23.77 million viewers by the end of June quarter from 21.3 million users in the previous quarter, sectoral regulator the Telecom Regulatory Authority of India (Trai) said.

Apart from the free DTH service of Doordarshan, there are six private DTH licensees - Dish TV, Tata Sky, Sun Direct, Airtel Digital TV, Reliance BIG TV and Videocon d2h. On installation of set-top boxes in Conditional Access System (CAS) notified areas in the four metros, Trai said 7,70,519 boxes had been installed till June 30 this year.

The STB industry is expected to grow at a rate of approximately 30% over the next few years since CAS is now mandatory and will be implemented in all four metros. Along with this other big players are also ready to enter in to the DTH services market. This will create stiff competition within the market which in turn will create and match huge demand of set top boxes in India.

There is a very good scope and market potential for Set Top Box and new entrepreneurs should venture into this field.

#### ***Cost Estimation:***

Capacity	:	180000 Nos./Annum
Plant & Machinery	:	66 Lakhs
Cost of Project	:	257 Lakhs
Rate of Return	:	44%
Break Even Point	:	54%

#### **Electrical Control Panel**

Electrical control panel is a flat, often vertical, area where control or monitoring instruments are displayed. Any complex piece of machinery requires a user interface to enable the user to monitor its operations, check for efficient

functioning, and intervene when required. Machines overheat, slow down, speed up or generally vary in their performance based on numerous factors such as fatigue, weather conditions, and the wear and tear of components and parts.

They are found in places such as nuclear power plants, ships, aircraft and mainframe computers. The range of electric panels is used for industrial purposes, generator panel building or apartment construction organization purpose and custom built designs. These control panels are designed for specific applications and are available in many different configurations. Like standard control panels, custom products are used to receive inputs, trigger outputs, and monitor systems and information. Examples include access control panels; electrical control panels, motor control panels, and pump control panels. Typically, these specialized control panels can be electronic, hydraulic, or pneumatic (air) with buttons, touch screen, knobs, or other analog or digital inputs.

In electrical machines, example like generators, these varying changes constitute an electrical signal. These signals can be intelligently processed to control the performance of the machine. A lot of machines in urban environments (such as signal lights and automatic doors) are completely self-managed due to such controllers. They have sensors that can detect changes in physical attributes like heat and speed and generate signals accordingly. Various equipments have similar sensors to detect changes in all kinds of various parameters. These can be used to control the equipment through a control panel.

There are many types of control panel such as Motor Control Centers, Power Distribution Panels, APFC Panels, Auto Mains Failure panels, Automation Panels, Pneumatic Control Panels, etc.

Electric equipment industry contributes over 2 per cent of GDP, which is projected to increase to about 12% in 2015 according to a study by Frost & Sullivan. During the period, consumption of electrical equipment is estimated to increase from over USD 28 billion now to USD 363 billion, growing at a CAGR of about 30%. It is also expected that during 2010-2015, the Indian equipment manufacturing will grow at 5.5 times the growth rate of global electronic equipment production.

In the electrical industrial equipment sub-sector, there are more than 75 companies in production producing switchgears, control panels and other industrial power distribution equipments/devices. Major players in electrical equipment segment are ABB, BHEL, BHEL Power Solutions, Havells India, Kirloskar Electric, Crompton Greaves and Suzlon Energy.

With some fast moves at launching fast track projects to augment power supplies, the Indian industry needs to improve its competitiveness. The Indian market is growing and multinationals with newer technologies are now more

active. It is expected that the Indian equipment manufacturing will grow at around 5-6 times the growth rate of global electronic equipment production. So, there is a good scope and bright future in this sub-sector.

***Cost Estimation:***

Capacity	:	3000 Nos./Annum 1000 Amp Size 10 X 6 X 2.5 Feet
Plant & Machinery	:	149 Lakhs
Total Capital Investment	:	1549 Lakhs
Rate of Return	:	49%
Break Even Point	:	28%

**Insulator**

In atoms which have a large number of electrons in the outer orbit, the combined force of attraction for the nucleus is much stronger, thus it is more difficult to force an electron out of orbit, and substances made up of these kinds of atoms are called insulators. In other words the substances, which strongly oppose flow of electrons through them, are termed as insulators.

Traditional ceramics consists of all the products made from clay or silicates. Ceramics today may be defined broadly as any non-metallic inorganic substance in the solid state, normally complex compound but occasionally simple oxides. Even a single element like carbon is an example of not only ceramics but also of a refractory product. Three classes of insulator are used in overhead lines, namely: Pin type, Suspension type and Strain type.

**Uses and Applications**

Low-tension insulators are used for A.C. & D.C. power supplies of not more than 600 volts. Low tensions insulators are manufactured in both glazed and unglazed insulators are quite satisfactory. Insulators required for use in humid atmosphere are invariably glazed. Glazed insulators are used in lighting arrestors in radio receivers, telephone and utility outfits and neon signs. Some L.T. insulators like nail knobs, tubes & cleats are glazed on one side. Voltage above 1000 Volts is generally considered as high tension for long distance Electric power transmission; high voltage is essential because it reduces the cross/section and, therefore, the weight of the conductor required. Porcelain insulators are suitable for high tension transmission & distribution are required to be effective at high voltages and under extreme climate conditions of rain, snow, high wind of soaring heat.

The end type insulator is used on all distribution lines and on low voltage transmission lines. The main advantage of the pin type insulator is that it is the cheaper insulator. Another advantage is that a pin insulator requires a shorter pole or tower to produce same clearance of the conductor above the cross arm, while the suspension insulator suspends it below the cross arm.



Pin insulators are constructed in the top and side groove type. Side groove insulators are suitable for small sized wires, and top groove insulators are used for larger size wire.

### Market Demand

The future demand for insulators may be estimated on the basis of the likely behaviour of following 3 sectors: Household sectors, Power sector and the demand for commercial and industry sectors. Keeping all these in view, the demand for insulators from domestic market is estimated to increase at 5% per annum. Besides this, there is a good scope for exporting insulators. It is estimated that the demand for insulators in export market will grow at 8% per annum.

Thus the demand is likely to increase by more 20000 MT during next 5 years. This provides scope for many power units in LT or lower grade of HT insulators. At least 20000 to 25000 MT capacities is required to be added in next 5 years. The concern of Government over safety is increasing particularly for commercial buildings will also increase the demand. However it may require suitable insulators for commercial development of buildings like cinema houses, star category hotels, auditoriums, schools and colleges etc.,

### *Cost Estimation:*

Capacity	:	2500 MT/Annum
Plant and Machinery	:	54 Lakhs
Total capital Investment	:	250 Lakhs
Rate of return	:	45%
Break Even Point	:	42%

### Distribution Transformer

The transformers is a device that transfers electricity or energy from one electric circuit to another without change of frequency and usually, but not always, with a change in voltage. In India the role of transformers assumes an added significance since in most of the states; electric supplies are not only erratic but are also characterized by wide variations in frequencies or voltages. These causes enormous damage to the electrical appliance like refrigerators, television and other industrial machinery engaged in the production of commodities. The transformer industry with the help of innovative methods, up gradation in technology etc., will have to manufacture transformers which offer maximum functional efficiency and are at the same time less hazardous or dangerous and economically viable. Over the past hundred years Transformers have played a major role in the growth of almost all industries in the world. The foundation for the ideal of a 'Transformer' was laid by Michael Faraday in the year 1831. Due to continuous efforts of physicists and engineers in the past year. Transformers, underwent many changes, to

keep pace with the rapid growth of electrical industries. Now there exists a variety of transformers each differing from the other in its operation, construction, size and applications.

### Applications

In India the role of transformers assumes an added significance since in most of the states; electric supplies are not only erratic but are also characterized by wide variations in frequencies or voltages. These causes enormous damage to the electrical appliance like refrigerators, television and other industrial machinery engaged in the production of commodities. The transformer industry with the help of innovative methods, up gradation in technology etc., will have to manufacture transformers which offer maximum functional efficiency and are at the same time less hazardous or dangerous and economically viable.

### Global Demand

India's Power and Distribution Transformers Market is estimated Grow Exponentially by 2012. Realizing the importance of private participation in the power sector, India is strengthening its policies to encourage private investments. The country's Electricity Act of 2003 caused the compulsory unbundling of the state electricity boards to improve their operational efficiencies, thus creating new market demand for better transmission equipment. As a result the Indian power and distribution transformers market is growing rapidly, according to a recent study by Frost & Sullivan, a global growth consulting company. The Frost & Sullivan studies found that revenues in this industry totaled US\$1.04 billion in 2005 and are likely to reach \$5.31 billion in 2012. Government's emphasis on the transmission and distribution sector reforms and investments are showing signs of fruition, thus creating a phenomenal growth opportunity for the Indian transformer market. "Due to rapid economic development and government's target of 'power for all by 2012,' the Indian power sector will need to replicate what has been achieved during the last 50 years in the next 10 years." During the period, consumption of electrical equipment is estimated to increase from over USD 28 billion now to USD 363 billion, growing at a CAGR of about 30%.

The demand of Transformers in the market is immense and therefore its market position is splendid. Hence it is an excellent field to venture.

### Cost Estimation:

Capacity	:	900 No.s/Annum DT(100KVA) 500 No.s/Annum DT(100KVA)
Plant and Machinery	:	245 Lakhs
Cost of project	:	527 Lakhs
Rate of return	:	43%
Break Even Point	:	60%

## Chapter 22

### ESSENTIAL OILS, PHYTOCHEMICALS AND AROMATIC CHEMICALS

#### Patchouli Oil

Patchouli oil is an essential oil, which is produced from the botanical source of plant name *Pogostemon cablin*. It is extracted from patchouli leaves as raw material by using solvent extraction or super critical carbon dioxide extraction process. There is very good demand of this product. Indian demand is being fulfilled by import. As a whole there is good prospect this product and one can enter in this field.

##### *Cost Estimation:*

Plant Capacity	:	50 Kg /Day
Plant & Machinery	:	Rs. 21 Lakhs
W. C. For 3 Months	:	Rs. 21 Lakhs
Total Capital Investment	:	Rs. 80 Lakhs
Rate Of Return	:	43.77%
Break Even Point	:	62.99%

#### Menthol Oil, Clove Oil & Citronella Oil

Menthol, Spearmint Oil, Citrate oil and Basil oil from Northern India found roads in to other countries. Menthol has got wide range of applications ranging from perfumery, cigarettes, liquors, as a hardening agent in chewing gum and number of pharmaceutical formulations. The oil obtained by the relatively simple process of steam distillation belong to the chemical class of plant product variably returned to as essential, volatile or ethereal oils, whose chemical composition consists almost entirely of hydrocarbon and oxygenated compounds known as terpenoids. The product has good domestic as well as export demand. New entrepreneurs can enter in this field.

##### *Cost Estimation:*

Plant Capacity	:	300 Kgs./Day
Plant & Machinery	:	Rs. 21 Lakhs
W.C. for 3 Months	:	Rs. 27 Lakhs
Total Capital Investment	:	Rs. 90 Lakhs
Rate of Return	:	74 %
Break Even Point	:	22.92 %

### Extraction of Jasmine Flowers

Jasmine flowers content sweet scented essential oil which likes by everybody in the society. It is very unstable compound are readily volatile. For extraction of Jasmine oil, it is require very careful cool distillation process. There are many aspects to be considered for running the business successfully. The amount of credit bills should not go beyond a certain limit. There are always new additions in the raw materials and in turn the fragrances and flavour may be modified suitably to include these raw materials. It is used to manufacture of jasmine scents for making very pleasant atmosphere. There is good scope for new entrant.

#### *Cost Estimation:*

Plant Capacity	:	4 Ltrs. Oil / Day 400 Kg. Flavour/Day
Plant & Machinery	:	Rs. 30.0 Lakhs
Working Cap. for 3 Months	:	Rs. 40.0 Lakhs
Total Capital Investment	:	Rs. 83.0 Lakhs
Rate of Return	:	23.59%
Break Even Point	:	62.81%

### Camphor Sheet from Camphor Powder

Camphor sheet is beauty of the camphor. It is generally prepared from camphor powder. Manufacturing of camphor sheet is a good expertise of technique. The market is good in India. Imports can be carried out from Europe or Asia. Plant, machinery, design, fabrication etc. all technologies are indigenously available. Safety precautions have to be taken against fire hazards. It is used for preparation of medicines, for purification of air, in religious ceremonies, to prevent microbial growth. The average growth of the market is 8 - 10%.

#### *Cost Estimation:*

Plant Capacity	:	1 Ton/Day
Plant & Machinery	:	Rs. 12.00 Lacs
Fixed Capital	:	Rs. 36.00 Lacs
Working Capital/Month	:	Rs. 31.00 Lacs
Total Capital Investment	:	Rs. 128.00 Lacs
Rate of Return	:	19.03%
Break Even Point	:	51.68%

### Rose Oil Extraction

There are more than 5,000 varieties of rose in India of which only a few yield essential oils. The varieties that are grown in India for obtaining essential oil are rose damascene mill (Fasli Rosa) and Rosa borboniana desp (Edward Rose).

Cosmetics and toiletries play an important role in the day to day life of men and women. The day starts and ends with the use of some cosmetics and toiletry or the other beginning from Soaps to Dental Cleaners, Shampoos, Hair Oils, Creams, Baby Powder, after Shave Lotion, Medicines, Sherbats, Room Fresheners etc. It exports 60% products to overseas market and 40% is indigenously sold. Rose oils has very good domestic as well as export market. It is advisable for new entrepreneurs to venture in to this field.

*Cost Estimation*

Plant Capacity	: 500 gms/day
Plant & Machinery	: 16 Lakh
T.C.I.	: 91 Lakh
Rate of Return	: 43%
Break Even Point	: 41%

**Spice (Chilli) Oleoresin**

India is world's largest producer and consumer of spices and chilli. A huge amount of spices is also exported all over the world. Oleoresins of spices consist of essential oils that impart aroma and resins that impart taste. Supercritical technology is state of the art technology which can be applied to extract oleoresins from spices & chillis. The taste efficiency of oleoresin is more than 100% that means extract from a chilli will impart more taste than the chilli itself. There is a very good demand of the product in domestic as well as international market, and the demand is expected to rise greatly in future.

*Cost Estimation:*

Plant Capacity	: 50 Kg/Day
Plant & Machinery	: Rs. 48 Lacs
Fixed Capital	: Rs. 73 Lacs
Total Capital Investment	: Rs. 100 Lacs
Production Cost/Annum	: Rs. 141 Lacs
Sales Turnover	: Rs. 166 Lacs
Profit/Annum	: Rs. 25.27 Lacs

**Essential Oil from Flowers (Rose Oil)**

Roses are cultivated in public and private horticultural gardens and nurseries throughout the country. A few scented varieties are cultivated on a small scale in U.P. for manufacture of rose water, gulkand and rose attar. The colour of rose oil is pale yellow, green or red transparent with a mild sweet taste and strong odour. Rose oils are in constant use as components of a wide range of flowers and fancy perfumes and many are found in cosmetics. Since the natural rose is highly costly compared to synthetic rose oil, the

natural oil is being replaced by synthetic oils. The main use of natural rose oil is in perfume spray industry, toilet soap industry, talcum powder industry, agarbatti industry. U.P exports about 60 % to overseas market and 40 % is sold indigenously. The largest buyers of scented agarbattis are USA, Nigeria, Singapore, S. Arabia, Kuwait, France, UAE and Yemen Republic. Cosmetics and toiletry have been an important part of every person's life, rich or poor. Hence these products always have users and their demand is ever increasing. Any entrepreneur can invest in this field with a mind on export.

***Cost Estimation:***

Plant Capacity	: 400 ML/Day
Plant & Machinery	: Rs. 8 Lakhs
W. C. for 3 Months	: Rs. 4 Lakhs
Total Capital Investment	: Rs. 29 Lakhs
Rate of Return	: 18.21%
Break Even Point	: 60.76%

**Essential Oil from Lily, Mogra, Nishigandha**

The applications of essential oils are very extensive and cover a wide range of human activities. A few important uses are in the manufacture of soaps, cosmetics, perfume, confectioneries, perfumes, chewing delicacies aerated water and syrups. Besides perfumery application they are also used in pharmaceutical industry because of their antiseptic, carminative varied from 0.5% to 1.5%. A vital pre requisite for successful marketing for these products is a thorough understanding of the channels and procedures by which the product pass from distillers/manufacturers to end users. This is an important as awareness of the size and breakdown of the market. There is need for new producer to establish and maintain, as early as possible.

***Cost Estimation:***

Plant Capacity	: 5.0 Litres/Day
Plant & M/c.	: Rs. 7 Lacs
W.C. for 3 Months	: Rs. 11 Lacs
Total Capital Investment	: Rs. 29.00 Lacs
Rate of Return	: 72.62%
Break Even Point	: 33.08%



## Chapter 23

### FAST MOVING CONSUMER GOODS (FMCG)

#### Instant Noodles

Instant noodles is a ready to cook and serve snack food which has become very popular in India in the recent years after its introduction on mass scale of M/s. Food Specialities Ltd, New Delhi under the brand name "Maggi".

The manufacture of instant noodles in Japan was developed in 1952. Today nearly 8,000 million packs per year are produced for domestic and export use. Meanwhile noodle manufacturing machines have become fully automatic, compact with high speed and effectiveness.

Instant noodles are manufactured in two kinds, namely, seasoned noodles and plain noodles with soup bag. The former must contain a seasoning liquid and highly humid glutinous wheat is used to prevent weakness in stickiness. The latter requires a white colour as its first prerequisite rather than stickiness. Thus wheat powder containing ash content of 0.3 - 0.45% is used as the raw materials.

Noodles are defined as the products which are formed in ribbon shape and which contain not less than 5.5% by weight of the solids of egg or egg yolk as a percentage of the total solids of the noodle product.

Along with the main material of wheat flour, carbonic salt water, common salt, soft water and other additives are required for the mixture. Carbonic salt water,  $K_2CO_3$  or  $Na_2CO_3$  is also an important additive, giving the noodle special stickiness, elasticity, smoothness and good taste.

The urgency for the development of nutritionally balanced protein foods which would be within the reach of a substantial portion of the population in a country like India can hardly be over-emphasized.

Since in early 1980's, a wide variety of processed foods have entered the market with a view to make the food available in convenient form. These include, ready to eat extruded foods, pasta products like macaroni, vermicelli and noodles ready to serve beverages fruits juices and concentrates, traditional foods such as papad and roti, instant mixes and blended masala, dairy products, coffee, tea and instant beverages from these, Soyabean-based beverages and textured vegetable proteins, frozen dinners and fast foods.

Instant noodles have become a popular food in many parts of the world, though they have undergone changes in flavor to fit local tastes. The size of the packaged food market in India is estimated at \$10 billion and is expected to reach \$20 billion by 2014, while the share of packaged food in the food and grocery market is expected to touch 5 per cent by the same time. The instant noodle market estimated to be valued at Rs 5.5 billion and growing at 15%, has some major players, such as Nestle, Indo Nissin Foods and International Best foods.

As Indian Market is Brand conscious, other competitors are coming up with more Indianised brand of products. The growing package and canned food market in India at 15% annually provides a huge market potential for new players in this sector.

There is an ample space and good market potential for new entrepreneurs in this field.

***Cost Estimation:***

Capacity	: 2250 MT/Annum
Plant and Machinery	: 122 Lakhs
Total Capital Investment	: 600 Lakhs
Rate of Return	: 38%
Break Even Point	: 41%

**Mishri (Sugar Candy)**

Candy Sugar, (or sweet diamonds as it is popularly called or mishri) is sparkling white big crystal sugar obtained by cooling supersaturated sugar solutions. Its large crystals not only are pure but are also very attractive. The English word "Candy" derives from Arabic "Qandi," meaning something made with sugar. Candy, specifically sugar candy, is a confection made from a concentrated solution of sugar in water, to which flavourings and colorants can be added. Candies come in numerous colours and varieties and have a long history in popular culture.

In India the large crystalline form of sugar is called "Mishri". The word "Mishri" comes from Chinese, originally Mi-Sha-Li, "sweet-pebble-glassy," a sweet crystalline (glassy) substance the size of pebbles. Candy Sugar has its origins in India and Persia. Arabic writers in the first half of the 9th century described the production of candy sugar. Crystals were grown as a result of cooling supersaturated sugar solutions.

Candy sugar is known for centuries for its therapeutic applications. It is also popular among makers of homemade fruit liqueurs. It is loved by both kids and grownups; this rock candy makes a good substitute for dessert after meals. You may be served "saunf" (fennel seeds and sugar crystals after lunch and dinner in hotels).

In ayurveda, when medicine contains sugar, this sugar or its powder is to be used when making medicines. If you taste refined sugar (ordinary sugar used while making tea/coffee) and the candy sugar you will realize the difference. Candy sugar contains some minerals which are compatible with milk. Candy sugar has more satisfying taste. The reason is slow crystallization which takes place gives slightly more ordered structure. Eating small amounts of sugar is considered good. It allows ingestion of slightly toxic medicines, which will be vomited otherwise. Honey also shares this property. With some fats and proteins, sugar adds fertility property. Such sweets are generally used as "Prasadam" in temples.

Sugar plays two very significant roles in relation to food security. First of all, sugar as a food crop may be considered an inexpensive and abundant source of calories and thus important in the fulfillment of basic human energy requirements. Secondly, sugar plays an important economic role in generating income, employment and export earnings.

Sugar is typically one of the most significant contributors to dietary energy supply. In fact, sugar is the third most important source of per caput dietary energy supply (DES) after cereal products. And it is a relatively inexpensive food. The cost of calories from sugar is about 15 percent less than that from cereals. At the global level, sugar, including non-centrifugal sugars, currently contributes more than 8 percent of total caloric intake, after cereals (52 percent) and oils (10 percent). Given the global population balance, these percentages closely reflect the situation in developing countries where sugar accounts for nearly 8 percent of total caloric intake, after cereals (57 percent) and oils (9 percent).

The candy sugar has a good market potential in India. Candy sugar is both known for centuries for its therapeutic applications and it also makes a good substitute for dessert after meals (fennel seeds and sugar crystals after lunch and dinner in hotels). The Indian hotel industry is on a roll. India's share in international tourism and the hospitality market is expected to increase over the long term. New budget and star hotels are being set up in the country. Many foreign hospitality players are heading towards Indian markets. The hotel industry in India is going through an interesting phase. Hence the demand for such product will definitely increase.

There is a good scope for new entrepreneurs to venture into this field.

***Cost Estimation:***

Capacity	: 900 MT/Annum
Plant and Machinery	: 43 Lakhs
Total Capital Investment	: 202 Lakhs
Rate of Return	: 48%
Break Even Point	: 40%

## Chapter 24

## FERROUS & NON FERROUS METALS AND ALLOYS

### High Carbon Ferro Manganese

Ferroalloys are alloys with iron employed to add chemical elements into molten metal, usually during steelmaking. Ferroalloys impart distinctive qualities to steel and cast iron or serve important functions during production and are, therefore, closely associated with the iron and steel industry, the leading consumer of its products. Ferroalloys are master alloys containing iron and one or more non-ferrous metals as alloying elements. The ferroalloys are usually classified in two groups: bulk ferroalloys (produced in large quantities in electric arc furnaces), and special ferroalloys (produced in smaller quantities, but with growing importance). Bulk ferroalloys are used in steel making and steel or iron foundries exclusively, while the use of special ferroalloys is far more varied.

Manganese is used in metallurgical industries in the form of ferro-manganese. Ferro-manganese contains about 80% Mn and 20% Fe. Generally ferro-manganese is produced in blast furnace or an electric furnace. There are no rigid ore-requirements for ferro-manganese produced in a blast furnace. Generally a mixture of different ores, proportional to meet the specification of the final alloy, is used.

Two manganese ferroalloys, ferromanganese and silico manganese, are a key ingredient for steelmaking. The high carbon ferromanganese (7.5 % C, 74 -80 % Mn & balance Fe) is the most important grade of ferromanganese, which is produced by carbothermic reduction of high grade Mn-ores (47 - 50% Mn) and a low iron content (6% Fe). The ore should also have low silica (1%) and low phosphorus (0.14 - 0.18 % P). The ore is smelted in an electric furnace with 15 - 20 % coke weight & suitable flux (lime).

The modern electric furnace route of ferro-manganese production gives 85 - 90% manganese recovery, MnO dust recycling is possible and a high degree of homogenization, slag control and furnace scabbing is practiced. Percentage of carbon present in Ferro Manganese alloys is of primary importance for steel production. Ferromanganese is widely used in the manufacture of tool steels (upto 0.4% Mn) and structural steel (upto 0.6%



Mn) and also of special steels with a high manganese content (upto 12-14% Mn), as well as an alloying addition. Electrolytic high purity ferromanganese finds an increasing use in metallurgical industry as an alloying element and as a deoxidizing agent.

Manganese is mostly used in steel production. Total manganese consumption by the steel industry is projected to grow at a CAR of 3.1% over the forecast period 2001-2011. More than 80% of manganese produced across the world is consumed by steel. Therefore, manganese consumption is mainly based on steel demand and is directly influenced by the steel industry. Over the past three years, as steel has witnessed an increase both in production and demand, manganese consumption has also increased simultaneously.

The demand for steel has been rising due to ongoing economic boom leading to rapid growth in various industries in the world's two largest populous countries in Asia-Pacific, China and India, with simultaneous increase in production leading to wide fluctuations in steel prices. Other countries in Asia-Pacific such as Japan, South Korea, and Taiwan; Middle East, Eastern Europe, and Latin America have witnessed an increase in steel consumption. Indian ferro alloy sector has a capacity of 3.64 million tonnes. This is sufficient to take to produce more than 150 million tonnes of steel. As against this, the Indian finished steel production was only 59.02 million tonne, though there are plans to scale the steel capacity to 124.06 million tonne by 2011-12 and to about 293 million tonne by 2020. So, the Ferro alloy industry is suffering gross under utilization of capacity, and may remain so in the short to medium term.

Domestic manganese ore required for manufacturing high carbon ferromanganese is mainly obtained from Orissa Mining Corporation (OMC), Manganese Ore India Limited (MOIL) and Rungta Mines.

India's ferro alloy producers include Nav Bharat Ventures, Ferro alloys corporation, Balasore alloys, Indian metals & Ferro alloys, Sri Vasavi Industries, Tata Steel (Ferro alloys & mineral division), Shyam ferro alloys, Sarda Energy & Minerals, S.A.L. Steel, Jindal Stainless, Rohit Ferro tech, Visa Steel, etc.

The huge steel demand from construction, automobile and machinery building sectors due to a growing urbanization and infrastructure, and proper capacity utilization will lead the ferro Alloys Industry to a bright future in the coming years.

#### *Cost Estimation:*

Capacity	: 15000 MT/Annum
Plant & Machinery	: 1032 Lakhs
Cost of Project	: 2319 Lakhs
Rate of Return	: 42%
Break Even Point	: 67%

### Iron ore Pelletization

Iron ore pellets are spheres of typically 8-18mm (0.31-0.71 inch) to be used as raw material for blast furnace. They typically contain 67-72% Fe and various additional materials adjusting the chemical composition and the metallurgic properties of the pellets.

Pellet plants can produce two varieties of pellets: blast furnace pellets and direct reduction (DR pellets) pellets. Blast furnace pellets are used in the coke based blast furnace process, which is most common method of producing hot metal (molten iron for steel making). It is mainly used in steel mills, where as DR pellet are used in the direct reduction processes to produce sponge iron, which is an alternative process route, as an initial stage from iron to steel. There is good demand of iron ore pellets, so new entrepreneurs can well venture in to this field.

#### *Cost Estimation:*

Capacity	: 1200000 MT/Annum
Plant & Machinery	: 3801 Lakhs
Cost of Project	: 6183 Lakhs
Rate of Return	: 47%
Break Even Point	: 45%

### Manganese Oxide (Ferrite Grade)

Manganese (Mn), is a chemical element, one of the silvery-white, hard, brittle metals of Group VII b of the periodic table. It was recognized as an element (1774) by the Swedish chemist Carl Wilhelm Scheele while working with the mineral pyrolusite and was isolated the same year by his associate, Johan Gottlieb Gahn. Although it is rarely used in pure form, manganese is essential to steelmaking.

Manganese Oxide is derived from manganese, a brittle metal element. It is widely distributed in the earth's crust, and is essential in steel-making. The element is needed for plant growth and in the physical development of higher animals. Manganese is involved in reducing the levels of nitrates in green plants. Lack of manganese causes testicular atrophy in animals. However, too much in either plants or animals is toxic. Manganese oxide is one of the major sources of manganese used in the dry feeds for cattle, pigs, & poultry. It helps to prevent breeding complications in cattle and ensures optimum growth for the pigs. In poultry it aids in hatchability and improves shell quality.

Manganese oxide is the most important manganese compound. Pyrolusite is the chief source of manganese and all its compounds, when derived from ores. Pyrolusite is widely used as a chemical oxidant in organic synthesis. Manganese oxide is also used as the cathode material in electric dry cells.



Synthetic manganese oxide is prepared by decomposition of manganese nitrate; by reaction of manganese sulfate, oxygen and sodium hydroxide; or by electrolysis of an aqueous solution of manganese sulfate. The ferrite grade manganese oxide ( $MnO$ ) is not easily available in local market so sometimes manganese dioxide is reduced to manganese oxide for the ferrite grade.

Ferrites are extensively used in the high-frequency magnetic cores of televisions, radios and other communications equipment such as magnetic heads, transformers and CRT deflection yokes. Ferrite may also be used as an ingredient of paints for the prevention of radio wave interference. Ferrite products currently applied in 42% of high-tech fields, such as home appliances (microwave ovens, air conditioners, and electrical home appliances), office supplies (copiers, fax machines) cars, motorcycles, high-fidelity audio, and instrument sensor parts. Middle and low areas of the application of traditional products accounted for 58%, such as speakers, adsorption magnets, toys, electrical, magnetic separation device.

The growing convergence of information, communication, & entertainment is bringing a new momentum to the consumer electronics industry in India. CE is one of the largest segments of the electronics market in India. With a market size of \$5 billion in 2009 & significantly low penetration, the consumer electronics industry in India promises huge potential in the years to come. It is estimated that the industry will grow to \$11.8 billion by 2014. This growth will be aided by various factors such as increasing household incomes, local manufacturing & expanding distribution networks. The electronics industry as we know it today could not exist without the widespread use of ferrites.

There is a very good scope for this product and new entrepreneurs should venture into this field.

***Cost Estimation:***

Capacity	: 1200 MT/Annum
Plant & Machinery	: 123 Lakhs
Cost of Project	: 316 Lakhs
Rate of Return	: 41%
Break Even Point	: 54%

**Reduction of Manganese Dioxide to Manganese Oxide 42%  
(By Rotary Kiln)**

Manganese dioxide is the inorganic compound with the formula  $MnO_2$ . This blackish or brown solid occurs naturally as the mineral pyrolusite, which is the main ore of manganese. It is also present in manganese nodules. It is used extensively as an oxidizing agent in organic synthesis for the oxidation of allylic alcohols.

Manganese oxide is the chemical compound with formula  $MnO$ . It occurs in nature as the rare mineral manganosite. It is a generic term used to describe a variety of manganese oxide and hydroxides.

The rotary kiln is basically a rotating inclined cylinder. Solids retention time in the kiln is an important design factor and is set by proper selection of the diameter, length, speed, slope and internals design. There are two basic types of rotary kilns; direct fired and indirect fired. both direct fired and indirect fired rotary kilns for a wide variety of applications. Direct fired rotary kiln has the combustion gases going through the kiln or dryer. The combustion can either take place in a combustion chamber or the flame can be directed down the length of the rotary kiln. Rotary kilns can operate in either the co-current mode where the gases and solids move in the same direction or in the counter current mode where they move in opposite directions. The kiln can also be operated in either the reduction or oxidation mode. Indirect fired rotary kiln the combustion or other form of heating takes place on the outside of the rotary kiln shell. This way, the material being processed does not come into contact with the combustion gases. Rotary kilns are used to heat solids to the point where a required chemical reaction take place. The demand growth of manganese oxide 42% is increasing day by day.

New entrepreneurs can well venture into this field.

***Cost Estimation:***

Capacity	: 6000 MT/Annum
Plant & Machinery	: 127 Lakhs
Cost of Project	: 678 Lakhs
Rate of Return	: 43%
Break Even Point	: 42%

**Ferro Alloys-Ferro Manganese, Silico Manganese, Ferro Silicon Based on Aluminothermic Process**

The primary objective of the study is to review the technological status of ferroalloys industry in the country in the area of bulk production of silicon. Bulk ferro alloys include ferro manganese, ferrosilicon etc.

Manganese is used in metallurgical Industries in the form of ferro-manganese. Ferro-manganese contains about 80% Mn and 20% Fe. Generally ferro-manganese is produced in blast furnace or an electric furnace. There are no rigid ore-requirements for ferro-manganese produced in the blast furnaces. The high carbon ferromanganese is the most important grade of ferromanganese, which is produced by carbothermic reduction of high-grade Mn ores, and low iron content. Ferromanganese is used to add manganese in steel equivalent to 200 series stainless steel.

Silicon manganese is produced by carbothermic reduction of Mn slag & quartzite. It should be noted that the derived level of phosphorus content in

the ferromanganese is 0.35% max. Silico-manganese is used as a blocking agent to prevent the reaction of carbon & oxygen in steel.

The most important consideration in the development of a satisfactory aluminothermic reaction is that the self-propagating reaction which occurs throughout the charge, consisting of an intimately mixed and finely divided mixture of aluminium powder and the metal oxide, shall produce enough heat to melt the products of reaction and to allow separation of the metal and the slag. The commercial development of the aluminothermic process was due largely to the work of H. Goldschmidt. The reaction is generally highly exothermic and the risk of explosion, therefore, sometimes considerable. Gold Schmidt developed satisfactory techniques for its control on a production basis. The excellent account of a modern aluminothermic plant has been given by them who list very fully the consideration, which leads to successful application of the process.

The Ferro Alloy Industry was identified by DSIR (Department of Scientific And Industrial Research) as one of the best sectors. This industry has already completed three decades of existence. This is principal alloying agent used in steel manufacturing, steel iron casting etc. where it also acts as a strengthener & deoxidiser. Ferro Alloys are important materials required for the country's steel production. So, there is good scope for new entrants in this field.

Domestic ferro alloy industry is not able to meet the steel industry expectation in spite of having enough capacity to manufacture ferro alloys

According to the data published by Indian Ferro Alloys Producers' Association (IFAPA), capacity utilisation of the ferro alloy industry is only 65 percent for the manganese and chrome alloys. Both the manganese and chrome alloy manufacturers are starved for the basic raw material - the ores.

In India, there are 133 companies producing ferro alloys in bulk with 252 furnaces. Most of the companies are manufacturing either manganese or chrome alloys. Few manufacturers concentrate on production of ferro silicon and the rest produce noble ferro alloys such as ferro vanadium, ferro molybdenum and other variants.

#### *Cost Estimation:*

Capacity	:	12 MT/Day
		Ferro Manganese –6 MT/Day
		Silico Manganese – 3 MT/Day
		Ferro Silicon – 3 MT/Day
Plant & Machinery	:	75 Lakhs
Cost of Project	:	242 Lakhs
Rate of Return	:	36%
Break Even Point	:	79%

### **Caramel Colour from Sugar**

Caramel colouring is a colour additive that is a dark-brown liquid or solid material resulting from the controlled heat treatment, often under pressure and at high temperature, of various food grade carbohydrates, such as high-dextrose corn syrup. Acids such as acetic acid, citric acid, lactic acid, or phosphoric acid may be used to break the bonds between sugars before the sugars are raised to a higher temperature for Caramelization. Caramelizing sugar is a term most often applied to melting sugar until it becomes a caramel colour liquid. Caramelized sugar is simply a mixture of sugar and water cooked until it becomes syrupy and darkens, and reaching a temperature from 320 to 356 degrees F. Caramel colour is a colloid, the specific gravity indicates the solids content and the strength of the colour. There are four distinct types of caramel colour as per their application to satisfy the requirements of different food and beverage systems: Caramel Colour I (also known as plain or spirit caramel), Caramel Colour II (caustic sulfite caramel), Caramel Colour III (ammonia or beer caramel, bakers and confectioners caramel) and Caramel Colour IV (known as sulfite-ammonia, soft drink caramel, or acid proof caramel).

### **Application**

Improving visual appeal is the primary purpose for caramel colour in a food or beverage system. Caramel colour also:

- Protects other ingredients from light deterioration
- Emulsifies flavour agents in the preparation of soft drink concentrates
- Standardizes batch-to-batch colour variation
- Caramel is used by the Malt and Milk foods industry as well as a natural colourant in pharmaceutical industries.
- Caramel colour serves as an emulsifier to impede separation of flavour oils

- Caramel colours also appear in beers, whiskeys, wines, rums and liqueurs.
- Negatively charged caramels (and, sometimes, specifically formulated spirit caramel colours) work well in whiskeys, wines, rums and liqueurs
- Soy sauce, which can be preserved with up to 15 percent salt, demands a caramel colour with the proper salt stability.
- Caramel colour is used to enhance the attractiveness of baked goods by supplementing the inadequate and irregular colouring power of refined ingredients in rye, pumpnickel, specialty breads, fillings, toppings, cakes and cookies.

### Global Scenario

The global food colours market was worth an estimated \$1.45 billion in 2009 relays an August 2010 market report, "The Global Market for Good Colours," by Leatherhead Food Research. World usage of food colours is currently about 40,000-50,000 tons. Although current economic conditions mean "annual growth levels have started to fall off sharply," says the report, by the middle of the next decade, the global market value is expected to reach \$1.6 billion, up 10% from its present levels. The global market for natural colours increased almost 35% in value, with much future growth expected to come from natural colours and colouring foodstuffs. Foods account for some 67% of the food colouring global market, followed by soft drinks (28%) and alcoholic beverages (5%).

The demand of Caramel colour in the market is immense and therefore its market position is splendid. Hence it is an excellent field to venture.

#### *Cost Estimation:*

Capacity	:	300 MT/Annum
Plant and Machinery	:	43 Lakhs
Cost of project	:	146 Lakhs
Rate of return	:	42%
Break Even Point	:	54%

### Frozen Finger Chips

The potato is a tuber grown underground on a specialized plant part (subterranean stem) known as stolon. A potato tuber is usually oval to round in shape, although intermediate shapes are also frequently encountered. It consists of an inner flesh and an outer protective cover known as a skin. There is a great variation in flesh colour and skin finish. And these two characteristics broadly, if not completely, determine the consumer preference vis-à-vis acceptability. The eye-shaped depressions on a potato tuber is known as its eyes, and actually these are the dormant buds, which give rise

to new shoots under suitable conditions. These white to creamy white or pigmented new shoots are known as sprouts. And that is why the process is known as sprouting. This is a very important process in potato, because a sprouted potato is not acceptable for consumption. But optimum sprouting is a desired attribute when the tubers are used for propagation.

### **Factors Affecting the Growth of French Fries**

French fries/wedges are growing at the rate of 25% in the country and it is likely to increase in coming years. The reason of this fast rate of growth is:

1. Fast growth of international fast food chain (25-30%) not only in metro but in other large towns.
2. Growing preference for Western snacks due to changing life style. French fries/wedges are likely to cut into Indian snacks like Samosa, Tikki, Pakoras etc.
3. Change in retail formats super market, shopping malls etc also stimulate the retail sales, as products are attractively displayed in visi-coolers/ deep freezers.
4. Demographic changes like, increasing income, small family, more working women etc. results into more eating out and purchase of ready to cook products.
5. French fries are also a complement item to many food products in restaurants, Bars and Pubs; this trend is growing and will contribute to its overall demand in near future.
7. A significant proportion of fresh French fries are also expected to get converted to frozen French fries.

### **Global Scenario**

Frozen Food in India industry profile provides top-line qualitative and quantitative summary information including: market share, market size (value and volume 2006-10, and forecast to 2015). The profile also contains descriptions of the leading players including key financial metrics and analysis of competitive pressures within the market. The market for frozen food in India increased at a compound annual growth rate of 15.2% between 2004 and 2009. The Indian frozen food market generated total revenues of \$325.9 million in 2010, representing a compound annual growth rate (CAGR) of 16.6% for the period spanning 2006-2010. The food processing industry has been slated for accelerated growth. It is projected to be a futuristic industry and it is anticipated that, over the years, it will emerge as a leading player in the global markets. As a result, the industry is seen to be witnessing feverish activity.



Therefore the scope for this product is very bright. An entrepreneur venturing into this project will find it very lucrative.

***Cost Estimation:***

Capacity	: 4840 MT/Annum or 1200 Kg potato per hour
Plant and Machinery	: 293 Lakhs
Total capital investment	: 1757 Lakhs
Rate of return	: 50%
Break Even Point	: 34%

**Stevia Extract: Stevioside**

Stevioside is a high intensity sweetener 250300 times that of sucrose, intended to be used in a wide range of low or reduced calorie food products and beverages. Stevia is the only natural sweetener available in the market. However, the sweet taste is not due to carbohydrate based molecules, but to several non caloric molecules called glycosides. Individuals who cannot tolerate sugar or other sweeteners can use stevia. Stevia is an artificial sweetener that has been widely used in most foods as well as beverages in the US as calorie free sweetener. It reduces the calories from your food which makes it a suitable replacement of sugar for calorie conscious as well diabetic people. It is also being found by people that the regular use of stevia helps in reactivating the insulin secreting cells in pancreas. The raw stevia leaves are around 35 - 40 times sweeter than sugar, stevia extract are sweet up to 300 times of ordinary sugar. The stevia is safest low calorie sweetener without any side effect. Stevia and stevia powder extract are marketed in many countries across the globes.

**Applications**

- ★ Majorly used as a pre packaged replacement for sugar and artificial sweeteners, in various food products.
- ★ Stevia is also useful in lowering blood sugar
- ★ Reduces the tooth cavity hence it can be used in tooth pastes in place of sugar to avoid tooth decay
- ★ Stevia leaf powder can be used as a face pack with rose water as it possesses great anti wrinkle qualities in it
- ★ It can prevent people from hypertension, diabetes mellitus, obesity, heart disease
- ★ Used in Japanese style pickles, dried seafood, fish meat products, vegetables and seafood boiled down with soy sauce, confectioneries and a host of other products.

### Global Demand

India's production 600 metric ton per annum

Stevia is poised for major growth in the Indian cash crop market as domestic and export demand pick up. Stevia production is likely to leap by as much as 300% over the next three years, according to Dr N Barathi, director of Grow more Biotech and Member of the 10th Planning Commission (Sub Group on Hi Tech Horticulture). Worldwide, 80,000 acres are covered under Stevia cultivation, of which China has a major chunk of 75%. In the last three years, the Indian farmers have also started taking up Stevia cultivation following the large demand for diabetic market here. Indian climate condition is most viable for the Stevia cultivation, which requires temperature of 15-25 degree Celsius. The country's total annual production is nearly 600 tonnes.

Since the applications and demand of Stevia is immense therefore the potential of the product is excellent. It is one of the imperative fields to endeavour.

#### *Cost Estimation:*

Capacity	:	135000 packs 100gm/Annum 67500 packs 200gm/Annum, 33750 packs 400gm/ Annum 13500 packs 1 kg/Annum
Plant and Machinery	:	84 Lakhs
Cost of project	:	274 Lakhs
Rate of return	:	44%
Break Even Point	:	56%

### Vermicelli, Noodles and Cherry (Tooti Fruity)

Vermicelli is an ancient symbol of festival in India. The vermicelli is in use since the early period of Indian civilization. Vermicelli nowadays is used by all community irrespective of their caste, religion and country. It is generally prepared at the occasion of Rakshabandhan or Rakhee by Hindus, by Muslim at Id, by Christians at the occasion of Good Friday and X-mass day.

In India, vermicelli is made from plain wheat flour or maida but in most of the western countries, different formulations have seen used to make vermicelli or the like products. All raw materials, plant, and machineries are available indigenously and can be started on fairly cottage small scale. This industry gives a good amount of return and therefore is useful for all those new entrepreneurs who have little sum to invest.

Noodles are a very important part of Indian and worldwide cooking. They are a staple ingredient in many recipes and a lot of signature dishes involve noodles. A noodle is a type of food with a thin and elongated shape made from unleavened dough that is cooked in a boiling liquid. There is a great

variety of noodles, which vary according to their region of production, ingredients, shape or width, and manner of preparation. Depending upon the type, noodles may be dried or refrigerated before cooking. Noodles are eaten hot or cold, steamed, stir-fried, deep-fried, boiled, or served in a soup. For the nutritionally-inclined noodles are excellent sources of protein. Besides being low in calories, they are extremely high in complex carbohydrates. Instant noodles are dried or precooked noodles fused with oil, and often sold with or without a packet of flavouring. Dried noodles are usually eaten after being cooked or soaked in boiling water for 2 to 5 minutes, while precooked noodles can be reheated, or eaten straight from the packet.

Tooti fruity is an Italian confection made with sliced fruit which has been candied or dried to preserve it. The fruit in tooti fruity is often brightly coloured with various dyes to make it more attractive and it may be used in a variety of ways. The term "tooti fruity" generally means "all fruit". Any fruit can be included in a tooti fruity mix if it can be dried well. Some common fruits include papaya, pineapple, mango, apricot, and grapefruit etc and many others can also be used, and sometimes nuts can also be included.

It is used as an additive in ice-cream and some sweets but its major consumption is in paan masala and some fresheners or "Mukhwas". This product can be manufactured across the country but unfortunately there are very few producers and demand is increasing.

Extruders are now used in a variety of applications, such as the manufacture of ready-to-eat breakfast cereals, pasta, noodles, meat analogues (nougats), filled snack products and pet food. It is also used in mechanical de-boning of meat and hops processing. Extruded products can be broadly categorized into products for human consumption, products for animal consumption, and biodegradable, non-consumable material.

The instant noodle market estimated to be valued at Rs 5.5 billion and growing at 15%, has some major players, such as Nestle, Indo Nissin Foods, and International Best foods. The size of the packaged food market in India is estimated at US \$10 billion and is expected to reach US \$20 billion by 2014, while the share of packaged food in the food and grocery market is expected to touch 5 per cent by the same time. The overall size of the snack food market is estimated at Rs 45 to Rs 50 bn. The market is reported to be growing at 7 to 8% annually.

The organized snacks category is sub-divided into the traditional segment (bhujia, chanachur and the like), Western segment (potato chips, cheese balls etc.) and the newly established finger snacks segment, which is an adaptation of traditional offerings in the western format.

In the Rs 19 billion branded (organized) snacks market, constituting over 40% of the market by value, Frito-Lay is estimated to command a market share of 45%, followed by Haldiram at 27% and ITC at 16%. The branded snacks market accounted for 16% by value and 12% by volume sales in

2007. According to a projection by Euromonitor International, the branded snacks market is growing at a compounded annual growth rate of 14%.

The demand for extruded food is ever increasing. There is good scope for new entrepreneurs.

***Cost Estimation:***

Capacity	:	Vermicelli 11250000/Annum (Each Pouches 200 gms) Noodles 30000000/Annum (Each Pouches 500 gms) Tooti Fruity 75000000/Annum (Each Pouches 100 gms)
Plant & Machinery	:	149 Lakhs
Cost of Project	:	382 Lakhs
Rate of Return	:	43%
Break Even Point	:	67%

**Sorbitol**

Sorbitol is in the form of white crystalline solid or 70% aqueous colourless, odourless syrup with sweet taste. In majority of applications 70% aqueous sorbitol is used. It is used as raw material for the manufacture of vitamin C and also as basic additive material in tooth paste, creams, cosmetics, paper and numerous food products. The present installed capacity for sorbitol in the country is around 60000 tonnes per annum. Around 300 tonnes per annum is exported. The demand for sorbitol is tremendously increase. New sorbitol project can be installing immediately on the basis of demand.

***Cost Estimation:***

Plant Capacity	:	40.0 Tonnes/Day
Plant & M/c	:	Rs. 31 Lakhs
W. C. for 3 Months	:	Rs. 91 Lakhs
Total Capital Investment	:	Rs. 151.0 Lakhs
Rate of Return	:	56.65%
Break Even Point	:	44.17%

**Furfural from Corncobs, Rice Husk & Sugarcane Bagasse**

Furfural is produced from agricultural waste biomass that contain pentosans, which are aldose to sugars, composed of small rings formed from short five-member chains, that constitute a class of complex carbohydrates, present in cellulose of many woody plants such as corn cobs, sugar cane bagasse,

rice and oat hulls etc. Furfural is a clear, colourless motile liquid with a characteristic 'almond-benzaldehyde' odour.

Any material containing pentosans can be used for the production of furfural. Technically furfural is produced by acid hydrolysis of the pentosan contained in woody biomass. Furfural is the only organic compound derived from biomass that can replace the crude oil based organics used in industry.

Furfural is used as a solvent in petrochemical refining to extract dienes from other hydrocarbons. Furfural, as well as its derivative furfuryl alcohol, can be used together with phenol, acetone, or urea to make solid resins. Furfural can be used for the production of lubricants; specialist adhesives and plastics; and nylons. It is the starting material for cycling shorts and many more.

The demand for furfural and furfuryl alcohol in the international market will maintain stable growth for the next few years. Due to problems in environmental impact and cost, the output of furfural in advanced countries such as the United States and European countries will decline further owing to the relatively low production cost of furfuryl alcohol in India. Expanded production of downstream products can remarkably increase the added value of India's furfural and furfuryl alcohol industrial chain. The production of THF (tetrahydrofuran) and PTMEG (polytetramethylene ether glycol) using furfural as raw material is an important way to increase the added value and is worth great attention from furfural producers.

Production of furfural and furfuryl alcohol is projected to increase at an average annual rate of 5% provided no shortage of raw material (corncoobs) is experienced. China is the only major region where increased furfural production is expected in the next five years.

There is a good scope to venture into this field for new entrepreneurs.

***Cost Estimation:***

Capacity	: 600 MT/Annum
Plant and Machinery	: 69 Lakhs
Cost of Project	: 278 Lakhs
Rate of Return	: 41%
Break Even Point	: 52%

**Soyabean Nuggets (Bariyani) (Automatic Plant)**

Now a day's protein enriched ready-to-eat foods are prepared using extrusion cooking. Soyabean after processing by heat treatment or germination to render the nutrients available is consumed in the form of flour, milk, curd, other fermented products and the products like soybean bariyan. Soybean and its various products were not much liked by local population in India earlier due to its characteristic nutty or beans like taste which is not much favoured in

India. To avoid this, various qualities of soybean were discovered devoid of favour and were popularized. Soybean bariyan is one among such products. These items can be made on small and tiny industries are not registered with D.G.T.D and hence no proper idea as to the capacity and production figure can be estimated. But owing to the increased varieties and manufacturers coming in this field, it can be concluded that these items are going very good popularly and can be further extended. All the raw materials and plant and machineries are available indigenously and hence unit for making Soyabean bariyan could be installed easily and without any foreign aid either technical or financial.

Soyabean bariyan, due to its high nutritive value and protein content, is becoming more and more common in the daily diet of India population.

***Cost Estimation:***

Capacity	:	300 MT/Annum
Plant and Machinery	:	17 Lakhs
Total Capital Investment	:	73 Lakhs
Rate of Return	:	43%
Break Even Point	:	42%

**Macaroni, Vermicelli & Noodles Manufacturing**

Macaroni are made from wheat flour, carbonic salt water, pure salt, soft water and other additives. Carbonic salt water with sodium or potassium carbonate as the main constituent is an important additive giving the stickiness, elasticity, smoothness and good taste.

India has the larger number of festivals in the world. These festivals are chiefly religious, secular and social. The festivals are therefore an intimate part of our religious as well as secular life. They are at the same time related to some ancient religious length, to the cycle of seasons, and to the community's need of change, release and economic well-seeing. Vermicelli, commonly known as "SAVAT" in India, is such an ancient symbol of festival. The vermicelli is in use since the early period of Indian civilization. Vermicelli now-a-days is eaten by all community of people. Vermicelli is consumed not only in India but in other countries like Pakistan, Bangladesh, U.S.A, U.K, all African and Middle East Countries apart from other Asian countries.

Instant noodles is a ready to cook and serve snack food which has become very popular in India in the recent years after its introduction on mass scale of M/s. Food Specialties Ltd, New Delhi under the brand name "Maggi". Instant noodles are manufactured in two kinds, namely, seasoned noodles and plain noodles with soup bag. The former must contain a seasoning liquid and highly humid glutinous wheat is used to prevent weakness in stickiness. The latter requires a white colour as its first prerequisite rather



than stickiness. Thus wheat powder containing ash content of 0.3 - 0.45% is used as the raw materials.

Ready to cook foods like macaroni, instant noodles, vermicelli etc are very popular in India. The changing life style of people in the present scenario has made ready to cook foods more popular among masses. But there is less number of single units for macaroni in India so far. Now day's macaroni manufacturing machines have become fully automatic, compact with high speed and effectiveness. All machineries are indigenously available and if they needed can also be imported from Japan, Germany, and Italy. The demand for macaroni, instant noodles and vermicelli food product is increasing day by day in India and it has a high demand in both domestic and foreign markets. Both the present demand as well as its future is very bright. The products have got a good export potential and the demand of macaroni is increasing day by day and with a colossal increase in its demand, more units are required to be set up to fill demand supply gap. Thus new entrepreneurs can venture into this field and he will find it a lucrative trade. From the observation of increase of market growth it can be predicted that there will be a good prospect of the new entrepreneurs.

***Cost Estimation:***

Capacity	:	300 MT/Annum
		100 MT Macaroni Per Annum
		100 MT Vermicelli Per Annum
		100 MT Atta Noodles Per Annum
Plant & Machinery	:	17 Lakhs
Total Capital Investment	:	38 Lakhs
Rate of Return	:	46%
Break Even Point	:	54%

**Sesame Seed Hulling**

Sesame is a flowering plant in the genus *sesamum*. Numerous wild relatives occur in Africa and a smaller number in India. It is widely naturalized in tropical regions around the world and is cultivated for its edible seeds, which grow in pods. The flowers of the sesame seed plant are yellow, though they can vary in colour with some being blue or purple.

The small sesame seeds are used as whole in cooking for its rich nutty flavour & yields sesame oil. Sesame oil is used also for massage and health treatments of the body and teeth in the ancient Indian ayurvedic system. Ayurveda views sesame oil as the most viscous of the plant oil and believes it may pacify the health problems associated with Vata aggravation.

They are also a good source of calcium, magnesium, iron, phosphorus, vitamin B1, Zinc and dietary fiber, sesamia has been found to protect the liver from oxidative damage.

There are three types of sesame seed, depending on the colour of the seeds, namely: white, brown and black. The white for the colour of the testa of these seeds ranges from cream to white. Brown seeds for the colour of the testa of the seed ranges from light-brown to dark-brown seeds for the colour of the testa of the seed ranges from dark-brown to black.

India ranks second in the world accounting for 22% of the world trade with a production of around 680,000 MT of sesame seed and 157000 MT of sesame oil. India exports around 25% of the produced sesame seeds annually, mainly to Germany, Turkey, The Netherlands, USA, Japan, China & U.K.

Therefore, there is good export as well as domestic prospects for the Sesame Hulling. New entrepreneur enter in this project will be successful.

***Cost Estimation:***

Capacity	:	9000 MT/Annum
Plant & Machinery	:	266 Lakhs
Total Capital Investment	:	2094 Lakhs
Rate of Return	:	52%
Break Even Point	:	38%

**Fish Meal**

Fish Meal is a dry & easily stored product forming a valuable ingredient of the rations of farm animals, particularly young pigs & poultry. Production of fish meal is basically from white fish offal, chiefly heads back bones. For the production in some factories, pelagic fish such as herrings, sardines & pilchards are used. It is only necessary to dry & grind white fish, offal to obtain a satisfactory meal, but oily fish or fish waste must be treated to remove most of the oil before drying & grinding.

***Cost Estimation***

Plant Capacity	:	30 Ton/Day
Plant & Machinery	:	Rs. 11 Lakhs
W.C. for 3 Months	:	Rs. 147 Lakhs
Total Capital Investment	:	Rs. 209 Lakhs
Rate of Return	:	50%
Break Even Point	:	32%

**Iodised Salt Free Flowing from Sea Water**

Iodised salt (also spelled iodized salt) is table salt mixed with a minute amount of various iodine containing salts. The ingestion of iodide prevents iodine deficiency. Worldwide, iodine deficiency affects about two billion people and is the leading preventable cause of mental retardation. It also causes thyroid gland problems, including endemic goiter. In many countries, iodine deficiency is a major public health problem that can be cheaply addressed by iodization

of salt. Salt was the name originally given to the residue left by evaporation of sea water. Afterwards the name was employed to include all substances held in solution in sea water. Chemists ultimately extended the name to cover all combinations of an acid and a base. Sodium chloride (NaCl) now called common salt, is an example of the simplest type of chemical salt. Sodium chloride is an essential constituent of the body fluids and is responsible for a number of vital functions in the body. Salt is existent in all animal and vegetable life and is coeval with life itself.

### Applications

Industries use most of the salt produced in the world today. Salt is the feedstock for the chloro alkali chemical industry, just as oil is for the petrochemical industry. The multiple chemical and physical properties of salt make possible 14,000 known uses. From the days of the cave men, humans have discovered ingenious means to use salt to enhance the quality of our lives. So valuable is this common mineral that wars have been waged and revolutions fought for access to salt. Its largest use is largely invisible to the public: about 40% of salt worldwide is used as the raw material that chemical companies transform into chlorine and soda ash, the foundations of inorganic chemistry. Salt is a processing aid in innumerable industries and the means by which animal nutrition experts ensure the health and productivity of livestock and poultry. We are all familiar with the salt shaker on the table in most of our homes. We less often think of the salt we use to regenerate our water softeners to protect the pipes and appliances in our homes. And seasonally, many of us give thanks for the salt that road maintenance crews apply to keep our cars, trucks and school buses safely on snowy winter roads.

### Global Demand

India is well endowed with saline water due to long coastal lines on 3 sides of the country. It is estimated that 93 per cent households consumed iodized salt in China, 48 per cent in Myanmar while neighboring Bangladesh and Nepal fared much better at 70 and 63 per cent respectively. Iodine deficiency is a problem of public health importance in India with no State or Union Territory totally free from it. Of the 312 districts surveyed by the Ministry of Health and Family Welfare, 254 were found to be endemic for iodine deficiency. Tata Chemicals entered in salt manufacturing. Both the salt works are spreader over, 5000 acres of area each. Government of India also got involved in salt manufacturing through public sector unit Hindustan Salts Ltd. Today out of the total salt produced 28.91 percent is produced by large salt works while 76.07 by salt farms.

The demand of the product in the market is immense and therefore its market position is splendid. Hence it is an excellent field to venture.

***Cost Estimation:***

Capacity	:	15000MT/Annum
Plant and Machinery	:	740 Lakhs
Cost of project	:	1219 Lakhs
Rate of return	:	46%
Break Even Point	:	40%

**Sugar Plant with Co-Generation Power Plant and  
Green Field Sugarcane Cultivation**

Sugar Industry is one of the most important agro-based industries and is highly responsible for creating significant impact on rural economy in particular and country's economy in general. Sugar industry ranks second amongst major agro based industries. The Plantation will have to be structured and planned in such a way the right ration mix is available when the mill, power plant and distillery become operational. The entire plantation will take around three years to develop and mature. In the Sub-tropical sugarcane is planted by conventional flat system and ridges and furrows system although special systems like paired row planting, trench, Planting and ring Pit planting are encouraged.

Sugarcanes are planted in furrows at either horizontal or at 45 degree angles. It takes anywhere between 12000 and 25000 stems to plant 2.5 acres (1ha) of land. After they are planted they are covered with a light layer of soil. When they begin to grow and start sprouting, the furrow is turned in wards and the crops mature over the span of 9 to 24 month. Seeds can be planted by hand or by sugarcane equipment that cuts the canes into setts or billets and plants them in furrows cane sugar industry is major industry in India. In recent years; it has developed to a great extent with an average production of 2 million tons of white sugar. Cane sugar is chemically known as sucrose. It is disaccharide or disaccharose, its molecule being make up of one molecule of glucose and one molecule of fructose. Its molecular formula is  $C_{12}H_{22}O_{11}$ .

The cane diameter various between 2"to 3". The stem consists of nodes and internodes and is covered by a rind. The internodes are made up of soft pith containing most of the sugar-bearing juice. Sugarcane contains 70 to 75% water 10 to 15% crystallisable sugar, 0.5 to 1.5% reducing sugar (uncrystallisable), 10 to 18% fibre (Indian cane contains 17% fibre on average), 1% of organic acids, gums and nitrogenous bodies. Ethanol, sometimes called methylated spirits, ethyl alcohol, is a member of a group of organic chemicals called alcohols. Ethanol has the chemical formula of  $CH_3CH_2OH$ , with the OH (hydroxyl ion) being the functional group. Ethanol is a colorless liquid with a boiling point of 172°F (78°C) and a characteristic sweet smell.

Industrially ethanol is now mostly frequently manufactured by the catalytic hydration of ethane or by the hydrolysis of ethyl sulfates. 1990s annual production of non-fermented alcohol was in the order of 24000 metric tons. Ethanol acts on humans as a depressant. In low doses ethanol can appear to have the opposite effect because it removes some inhibitions. The term power plant is often used loosely to designate any plant in which steam is generated regardless of whether power is produced. In a more exact sense an industrial steam power plant is one in which power is generated from steam. The term power generation in the engineering sense implies the production of mechanical or electrical power from some other source of energy e.g. thermal hydroelectric or electrochemical energy.

There is a very good scope and for such products and new entrepreneurs should venture into this field.

***Cost Estimation:***

Capacity	:	55000 MT Sugar/Annum 9000 Kls. Distillery/Annum 72000 MW Power/Annum Cultivation Area 6000 Hectare Sugarcane Crushing Cap. – 2500 MT/ Day
Plant and Machinery	:	37613 Lakhs
Total Capital Investment	:	82600 Lakhs
Rate of Return	:	32%
Break Even Point	:	44%

***Information***

- ★ One Lac / Lakh / Lakhs is equivalent to one hundred thousand (100,000)
- ★ One Crore is equivalent to Ten Million (10,000,000)
- ★ T.C.I. is Total Capital Investment
- ★ All costs/amount given in INR ₹
- ★ NPCS can provide customized Detailed Project Report on all the projects
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## Chapter 26

## FRUITS & VEGETABLES AND ITS PRODUCTS

### Coconut Processing Unit (Complex)

Coconuts are the fruit of the coconut palm, botanically known as *coco's nucifera*, *nucifera* with meaning "nut-bearing." Coconut is one of the important fruit having large uses starting from bakery, confectionery, pharmaceutical industries to beverage industry and many more industries. Several products from coconut kernel can be manufactured such as Coconut powder (desiccated), Coconut flour, Coconut Oil, Coconut Cream, Coconut milk, Coconut milk powder, Coconut water, Coconut water beverages etc. Besides there are several By products can be processed like paring oil, Coconut Shell Powder, Activated Carbon, Coir dust, Rubberized Coir etc. There are mainly two distinct groups of coconut i.e. tall and dwarf, (semi tall also exist between). There are mainly two distinct groups of coconut i.e. tall and dwarf, (semi tall also exist between).

### Application

- ★ Coconut oil is extensively used for edible and industrial purposes
- ★ Coconut shell powder is used as compound filler in synthetic resin glues, as filler and extender in the manufacture of phenolic moulding powder, for specialized surface finishes and as filler in plastic products, mastic adhesives, biluminous products, mosquito coils and agarbathis.
- ★ Coconut water is an important by-product of the coconut processing industry. A process has been developed for the up gradation and preservation of mature coconut water and bottling it as a soft drink. The coconut water can also be made into good quality vinegar. Coconut water is also an important substrate for yeast production.
- ★ Coconut shell charcoal is used in the manufacture of activated carbon.
- ★ Coir fiber is considered to be superior to all other fibers for manufacturing of cables. It is light, elastic, and highly resistant to water. Coir is utilized to manufacture of shockproof packing materials and hard boards suitable for tabletops, doors, panels and battery Container. The Coir is at present utilized coir mattresses etc.



- ★ Granulated activated carbons are used for purification of gases or liquids and are used in a vertical carbon packed column.
- ★ Coconut oil is also used in the replacement of other oils/butter in recipes.
- ★ Coconut oil can prevent nose bleeding that is caused by sensitivity to weather such as extreme hotness and extreme coldness.

### **Indian Scenario**

India is the third largest coconut producing country in the world .It contributes 15% of the area and 25% of the production of coconut in the world. Coir and coir products, milling copra and coconut oil are the major commercial products produced in the country. In India as much as 48% of the coconut production is used for edible and religious purposes, 10% as tender coconut, roughly 30% as milling copra for oil extraction, 8% for the manufacture of edible copra and the rest is processed into products like desiccated coconut and coconut cream. The production of coir and coir products constitutes 55% of the world output. India's export trade accounts for 30% of the total export trade in the world.

Since the applications and demand of coconut and its products is immense therefore the potential of the product is excellent. It is one of the imperative fields to endeavour.

### ***Cost Estimation:***

Capacity:	
Coconut powder	: 1500 MT/Annum
Coconut water	: 9000 MT/Annum
Coconut oil	: 225 MT/Annum
Coconut milk liquid	: 900 MT/Annum
Coconut milk Beverage	: 525 MT/Annum
Coconut skimmed milk powder	: 1050 MT/Annum
Coconut cream	: 2100 MT/Annum
Paring oil	: 330 MT/Annum
Coconut coir	: 4920 MT/Annum
Coconut shell powder	: 1500 MT/Annum
Activated carbon	: 750 MT/Annum
Plant and Machinery	: 770 Lakhs
Cost of project	: 1930 Lakhs
Rate of return	: 41%
Break Even Point	: 64%

### **Mango Pickles**

The raw mango is so closely associated with the Indian cuisine, that almost every community has an array of recipes-especially pickles-that employ this

seasonal treasure. Mango (*Mangifera indica* L.) is one of the most important tropical and subtropical fruits of the world and is popular both in the fresh and processed form. India occupies 54 per cent of the world's production of mango. There are varieties of products that are produced from mango; Mango Juice, Mango Pulp, Mango Flavour, Mango Kernel Oil, Mango Pickles, Mango Powder etc. are the products from mango. Pickle is a general term used for fruits or vegetables preserved in vinegar or brine, usually with spices or sugar or both. Pickle producing businesses are engaged in producing pickle in different varieties. Among the Indian pickles the ones from mango are very popular. There are three types of mango pickle: sour mango pickles, sweet mango pickles and dried mango pickle.

### Applications

1. It is used as palatable food materials.
2. It is largely used in the domestic food products during breakfast, lunch or dinner.
3. It can be easily transferred from one place to another place.

### Market Potential

There is very good market demand of mango pickles. This is manufactured by some well organized sector as well as many unorganized private tiny and small scale sector. There is scarcity of availability of green mangoes throughout the year. It is mostly available in our country in the month of April – August. Market demand almost increases by 3% per annum which is actually population growth rate. There is very good export demand in the European countries as well as in the Middle East Asian countries.

Therefore the demand of mango pickle in the market is enormous and therefore its market position is splendid. Hence it is an excellent field to venture.

### *Cost Estimation:*

Capacity	: 1000 Kg/Day
Plant and Machinery	: 25 Lakhs
Total capital investment	: 130 Lakhs
Rate of return	: 49%
Break Even Point	: 38%

### Drumstick Powder

India has a major agribusiness sector which has achieved remarkable successes over the last three and a half decades. India ranks first in the

world in production of fruits and second in vegetables. The changing food habits of people are discernible. There has been a positive growth in ready-to-serve beverages, fruit juices and pulps, processed fruits and vegetables products, i.e., dried or preserved and dehydrated vegetables and fruits. Moringa or drum sticks is among the well known vegetables being used in our food during its availability. It is commonly known as "Sejana". Each vegetable and fruit has its own nutritional content.

Moringa tree is mainly grown in semi-arid, tropical and sub-tropical areas. While the best type of soil for this tree is dry and sandy, it can also tolerate poor soil such as that found in coastal areas. The tree is native to the Himalayan foothills in Northwestern India. Moringa is widely cultivated in areas such as Africa, Central and South America, Sri Lanka, India, Mexico, Malaysia, and the Philippines. It is believed to be one of the most useful trees in the world. Its leaves are highly nutritious, being a significant source of beta-carotene, Vitamin C, protein, iron and potassium. The leaves are cooked and used as spinach. The tree has a medium height, extending to 15-20 feet. The fruits are 6-8 inch long, brown in colour and have six visible veins. The leaves are 1-2 feet long and leaflets are in pairs of 6 to 9, with a width of ¼ inches. The seeds of *Moringa oleifera* are triangular in shape and astringent in taste.

The usage of drumstick powder is mainly used in curries, kormas, and dal. Apart from that it also makes good savory outlets. It imparts that special flavour to sambars and is used as a thickening agent. It gives a distinct palatable taste and is a rich source of glutamic acid and it is highly useful in joint pains.

Dehydrated drumstick powder is an integral part of Indian cuisine and is extensively used in many food and curry preparations. It is a mass consumption item used round the year. Apart from individual households, it is used in large quantities in restaurants, dhabas, road-side eateries, hotels and canteens and many such places. But the conventional method of eating the fresh pod is not easily available instantly. Hence dehydrated drumstick powder has become acceptable.

Drumstick is one of the world's most useful trees with potential to improve nutrition, boost food security, foster rural development and support sustainable land care. From leaves and root to pods and seeds, all parts of the drumstick tree are highly edible.

The drumstick is valued mainly for its tender pods, which are relished as vegetable but all its parts – bark, root, fruit, flowers, leaves, seeds and even gum – are of medicinal value. They are used in the treatment of ascites, rheumatism and venomous bites as antiseptic and as cardiac and circulatory stimulants. India is the largest producer of drumstick with an annual production of 1.1 to 1.3 million tonnes grown over 38,000 hectares. Andhra Pradesh leads with 15,665 hectares under murungai cultivation, compared to 7,406 hectares in Tamil Nadu.

Drumstick in powder form is easily soluble, is in compact form and very convenient to transport. With increasing health awareness and improved standards of living, drumstick powder has good market potential. New entrepreneurs should venture into this field.

***Cost Estimation:***

Capacity	: 300000 Kgs./Annum
Plant & Machinery	: 19 Lakhs
Total Capital Investment	: 94 Lakhs
Rate of Return	: 52%
Break Even Point	: 41%

**Dry Lemon Powder and Lemon Oil**

The lemon is a small evergreen tree (*Citrus limon*) originally native to Asia and is also the name of the tree's oval yellow fruit. The fruit is used for culinary and non-culinary purposes throughout the world – primarily for its juice, though the pulp and rind (zest) are also used, mainly in cooking and baking. Lemon is about 5% (approximately 0.3 mole per litre) citric acid, which gives lemons a sour taste, and a pH of 2 to 3. This makes lemon juice an inexpensive, readily available acid for use in educational science experiments. Because of the sour flavour, many lemon-flavoured drinks and candies are available, including lemonade and sour heads.

Lemons are used to make lemonade, and as a garnish for drinks. Lemon zest has many uses. Many mixed, soft drinks, iced tea, and water is often served with a wedge or slice of lemon in the glass or on the rim. The average lemon contains approximately 3 tablespoons of juice. Fish are marinated in lemon juice to neutralize the odour. Lemon juice, alone or in combination with other ingredients, is used to marinate meat before cooking. Lemons, alone or with oranges, are used to make marmalade. The grated rind of the lemon, called lemon zest, is used to add flavour to baked goods, puddings, rice and other dishes. Pickled lemons are a Moroccan delicacy. Numerous lemon liqueurs are made from lemon rind. Apart from the juice, the essential oil extracted by steam distillation is an important product from the fruit. Lemon oil is highly beneficial for medicinal purposes. The main chemical components of lemon oil are  $\alpha$ -pinene, camphene,  $\beta$ -pinene, sabinene, myrcene,  $\alpha$ -terpinene, linalool,  $\beta$ -bisabolene, limonene, trans- $\alpha$ -bergamotene, nerol and neral.

India tops the production list with ~16% of the world's overall lemon and lime output followed by Mexico (~14.5%), Argentina (~10%), Brazil (~8%) and Spain (~7%). The Indian market for processed foods is growing at over 12 per cent a year, propelling demand for flavours in savoury foods and beverages as the large food makers make inroads into the region. Globally, the flavours

and fragrances industry is estimated at about ₹14.8 billion, of which the top five players account for 40 per cent of the market. These top five companies have a substantial presence in the ₹187 million Indian flavours and fragrance market - flavours make up 45 per cent of the market, and fragrances 55 per cent. Fragrances will continue to play an important role in product differentiation, aiding demand growth. Environmental fragrance goods will also experience healthy gains through 2012, driven by advances in aromatherapy and household applications, as well as consumer desires for more sophisticated and blended fragrances. Food will remain the largest market for flavours and fragrances, based on the widespread application of flavour materials in processed food, dairy and bakery products, candy and confectioneries, and other items such as breakfast cereals and bars, meat and seafood products, snack food and meal supplements/replacements. The further expansion of fortified food as well as beverages will provide opportunities, since flavours are often used to cover up the off-tastes of vitamins, minerals, antioxidants and other additives.

There is a good scope for new entrants and entrepreneurs should venture into this field.

#### *Cost Estimation:*

Capacity	:	10 MT/Lemon Powder per Annum 13500 Nos. Bottles Oil each Bottle 500 ML. Per Annum
Plant & Machinery	:	141 Lakhs
Cost of Project	:	290 Lakhs
Rate of Return	:	43%
Break Even Point	:	49%

#### **Tomato Paste (Tomato Concentrate)**

In view of the important of tomato either fresh or processed in the daily diet due to the high nutritive value, there are good potentials to develop this industry in the country in the small scale sector. This product contains total solids not less than 25%, but it can further be concentrated up to 33% solids. It is prepared by concentrating tomato juice or pulp without seeds and skin. It is used for preparation of various products such as Sauces, Ketchup, Chutney, Soup, Tomato Juice, and also as an ingredient in various type of Sauces, Canned Fish, process beans and related products. To prepare this tomato paste, various types of tomatoes are taken, which are well ripened. So the fresh ripened tomatoes are very refreshing and appetizing. They are good source of vitamins. In special consideration to tomato powder, it is very much useful in the developing and cultured societies. There is good scope of this project.

***Cost Estimation:***

Plant Capacity	: 12 Ton/Day
Plant & Machinery	: 23 Lakhs.
Total Capacity Investment	: 469 Lakhs
Rate of Return	: 47%
Break Even Point	: 36%

**Fruit Processing  
(Mango, Lychee, Pineapple, Orange & Pomelo for  
Concentrates, Juice in Cans)**

Juice is the liquid that is naturally contained in fruit or vegetable tissue. Juice is prepared by mechanically squeezing or macerating fresh fruits or vegetables flesh without the application of heat or solvents. For example, orange juice is the liquid extract of the fruit of the orange tree. Juice may be prepared in the home from fresh fruits and vegetables using a variety of hand or electric juicers. Many commercial juices are filtered to remove fiber or pulp, but high-pulp fresh orange juice is a popular beverage. Juice may be marketed in concentrate form, sometimes frozen, requiring the user to add water to reconstitute the liquid back to its "original state". However, concentrates generally have a noticeably different taste from that of their "fresh-squeezed" counterparts. Other juices are reconstituted before packaging for retail sale. Common methods for preservation and processing of fruit juices include canning, pasteurization, freezing, evaporation and spray drying.

Fruit juices consist of 100% pure fruit juice made from the flesh of fresh fruit or concentrates and contain no preservatives or any other added ingredients. Some minor exceptions exist in order to ensure that the final product is of an acceptable taste. These exceptions are very specific and are controlled by government legislation in the form of the Fruit Juices & Nectars Regulations.

The branded fruit juices market inclusive of nectars is placed at about Rs 10 billion. The pure fruit juices are the preferred drink among the fruit drinks. This segment is growing at around 10% annually.

Consumption per capita of juices in India is very low. It is estimated at a fraction of a liter - 20 ml. China has attained a consumption level of 1500 ml. The consumption in India is basically an urban phenomenon. Nonetheless, it is gaining slow but steady penetration into the rural areas.

The market size of the food processing industry is likely to increase from Rs 4600 billion in 2003-04 to Rs 8200 billion in 2009-10, and to Rs 13,500 billion in 2014-15. In the coming years India's share in the global processed food industry will get a raise from one per cent to three per cent. Indian food processing activity is still largely based on primary processing, which accounts for 80 per cent of the value addition. In the area of packaging, Tetra-Pak India, a part of the \$ 10 billion Tetra Laval group, has become the major source of brick cartons amenable to aseptic packaging and imparting long



product shelf-life to the foods. Tins, nonetheless still continue to be in the market in family size packing.

There is an ample space and good market potential for new entrepreneurs in this field.

***Cost Estimation:***

Capacity	:	1475 Kls/Annum Fruit Juice 25 MT/Annum Fruit Juice Concentrate
Plant and Machinery	:	210 Lakhs
Total Capital Investment	:	580 Lakhs
Rate of Return	:	44%
Break Even Point	:	39%

**Cashew Nut Shell Liquid & Kernel Processing**

Cashew was introduced in India by the Portuguese four centuries ago mainly to prevent soil erosion. Cashew ranks second among the nine tree nuts which figure prominently in international trade circles, first being almond. The cashew adapts to various types of soil and climatic conditions and is hardy and draught resistant tree. India is the largest producer, consumer and exporter of cashew nut. It is grown in Kerala, Karnataka, Goa and Maharashtra along the west coast, and Tamil Nadu, Andhra Pradesh, Orissa and West Bengal along the East coast to a limited extent Madhya Pradesh, Manipur, Meghalaya and Tripura also share its cultivation and production. Cashew nut processing allows for the development of an important by products, which can increase its added value. The liquid inside the shell represents 15 percent of the gross weight and has some attractive possible medicinal and industrial uses. CNSL is one of the few natural resins that is highly heat resistant and is used in braking system and in paint manufacture. It contains a compound known as anacardium, which is used to treat dermatological disorders. The main markets for CNSL are the United States, the European Union, Japan and Republic of Korea. Together these account for over ninety percent of world trade, most of which is supplied by India and Brazil. Cashew plays a prominent role in the Indian economy. It is commercially important because of substantial export earnings India gains by it international trade. Raw cashew nut is major raw material for processing industries in India.

There is very wide scope and good market potential of products manufactured in this sector.

***Cost Estimation:***

Capacity	:	150 MT/Annum 2MT Cashew Nut Processing/Day 0.40 CNSL/Day 1 MT Waste Shells/Day
Plant & Machinery	:	32 Lakhs
Cost of Project	:	59 Lakhs
Rate of Return	:	49%
Break Even Point	:	37%

## Chapter 27

## GINGER PROCESSING AND GINGER PRODUCTS

### Dry Ginger from Green Ginger

Ginger is one of the oldest and most important spices, consists of the prepared and semi-dried rhizomes of ginger officinale hiscoe belonging to family ginger areas. Ginger possesses a warm pungent taste and pleasant smell hence its wide use as flavourant in numerous food preparations and beverages, baked food, confectionery, ginger bread, savory dishes, currie, soup, pickles and many other soft drinks. Ginger is consumed all over the world, particularly in tropical and warm countries. Ginger tea is regarded as a carminative to exes an ailing stomach and is used for this purpose through out the world. Ginger is used for producing ginger oil and oleoresin. There is a good demand for ginger items. There is good scope for new investment.

#### *Cost Estimation:*

Plant Capacity	: 1 ton/Day
Plant & Machinery	: 7 Lakhs
Total Capital Investment	: 83 Lakhs
Rate of Return	: 35%
Break Even Point	: 40%

### Ginger Powder

The ginger whole shall be the rhizome of ginger officinale rose in pieces irregular in stapes and size not less than 20mm, in length or in small cut pieces, pale brower in colour and fibrous with peel not entirely removed washed and dried in the sun. The material may be garbled by removing pieces that are too lighter and it may also be lime bleached. The dried rhizomes may also be ground into powder. It can be used as pharmaceuticals for the production of herbal medicines in the treatment of cold fever. It can be used as additive for the food supplement. Powder ginger has very good domestic as well as export market. Any new entrepreneurs entering in this field will successful.

***Cost Estimation:***

Plant Capacity	: 250 kg/Day
Plant & Machinery	: 17 Lakhs
Total Capital Investment	: 95 Lakhs
Rate of Return	: 45%
Break Even Point	: 43%

**Ginger Paste in Pouch/Black Container**

Ginger is one of the most important vegetables, which is produced by cultivation process. It is one of the agro based products, which has good commercial as well as industrial value. It is basically used mostly in all of the houses as spice. Ginger can be preserved by food preservation process. It is processed by making paste and sterilized to keep it for long time. For making ginger paste, there is basic plant machineries required, are grader, screening, paste making machine, steriliser, automatic filling, weight and packing machine etc. There is good quality control laboratory necessary for making good products for increasing the self life of product. There is pollution, produced from the plant, which can be solved by proper precaution. It has fair market growth. New entrepreneur may be successful by his hard workship and by his marketing intelligence. As a whole it is totally a fair project.

***Cost Estimation:***

Plant Capacity	: 2 MT/Day
Plant & Machinery	: 35 Lakhs
Total Capital Investment	: 211 Lakhs
Rate of Return	: 56%
Break Even Point	: 36%

**Glazing & Preservation of Ginger**

Ginger is botanically named as *Z. officinal*, which is the main source of ginger. Ginger is cultivated on a large scale in India. It is exported to other countries the world over. The major areas of usage of ginger is in the flavouring, seasoning and garnishing of food by domestic consumers. Fresh ginger is some time used in the preparation of ginger wine and in one or two countries the juice is used as a beverage. Substantial quantities of fresh ginger are also used in the preparation of sauce and pickles in both producing and importing countries. Preserved ginger in its crystalline form is used as a sweetmeat when preserved in syrup. It is mainly used as a dessert in its own right although it is also some time incorporated in such products as cakes, fruits salads, yoghurt for ice cream. New entrepreneur may come this fields and get profit.

***Cost Estimation:***

Plant Capacity	: 1 ton/Day
Plant & Machinery	: 7 Lakhs
Total Capital Investment	: 83 Lakhs
Rate of Return	: 35%
Break Even Point	: 40%

**Ginger Oil (Super Critical CO<sub>2</sub> Process)**

Ginger is one of the most important and oldest spice used in every kinds of food preparation. There are two general types of ginger viz. fresh green ginger used for the preparation of candied ginger (in Sugar Syrup) and dried or cured ginger applied in the spiced trade for the distillation of its volatile oil. Ginger possesses a warm pungent taste and a pleasant odor, hence its wide use as a flavourant in numerous food preparation and beverages, ginger bread, soups, pickles, and many popular soft drinks. Like most pungent spices, ginger is consumed all over the world, particularly in tropical or warm countries. It dilates the superficial vessels of the spine, resulting first in a feeling of warm. There is good scope for new investment.

***Cost Estimation:***

Plant Capacity	: 40 kg/Day
Plant & Machinery	: 158 Lakhs
Total Capital Investment	: 282 Lakhs
Rate of Return	: 26%
Break Even Point	: 58%

**Ginger (Dry, Powder, Flakes, Oil) & Garlic (Powder, Flakes, Oil) Processing Unit**

The food processing industry is a strong component of the larger agro industrial sector. Dry ginger, ginger flakes, garlic flakes and dry powder are all vegetable processed products. In India there are some specific states where ginger and garlic are abundantly available. Processing of ginger and garlic combination is unique combination of vegetable processing which are mostly available throughout the year. Ginger oil and garlic oil both are high valued spice oil. Both of the products are highly demanded items for processing in the dry form of ginger. There is good export market for both the products. In the manufacturing process there is environmental pollution arises, which can be solved by proper treatment. As a whole manufacturing of dry ginger, ginger powder, ginger flakes, garlic flakes, garlic powder & garlic oil is best items of the vegetable processing. There is good scope for new entrepreneurs.

***Cost Estimation:***

Plant Capacity	:	Garlic Flakes 750kg, Garlic Powder 750kg & Garlic Oil 10kg/Day, Ginger Dry 500kg, Ginger Powder 500kg, Ginger Flakes 500kg & Ginger Oil 10 kg/Day
Plant & Machinery	:	57 Lakhs
Total Capital Investment	:	265 Lakhs
Rate of Return	:	37%
Break Even Point	:	42%

**Ginger Oil**

Ginger is one of the oldest and most important spices used in different kinds of food preparation. Ginger possesses a warm pungent taste and a pleasant odor, hence it has a wide use as a flavoring in numerous food preparation, beverages, ginger bread, soups, pickles and many soft drinks. There are two general types of ginger viz. fresh green ginger used for the preparation of candied ginger (in sugar syrup) and dried or cured ginger applied in the spice trade, for extracts, oleoresins and for the distillation of its volatile oil. The main application of the ginger oil is in confectionery, beverages, and baked products.

Ginger oil is obtained from the root of the herb *Zingiber officinale*. The peculiar hot taste and pungent taste of ginger can be attributed to the presence of an acrid compound called gingerol. Most of the health benefits of ginger are due to Gingerol. The essential oil of ginger exhibits numerous precious benefits for the well-being of mankind. Varied in color tones, from pale yellow to a darker amber color; the oil also differs in viscosity, ranging from medium to watery. Ginger oil has rich sources of a multitude of chemical constituents including  $\alpha$ -pinene, camphene,  $\beta$ -pinene, 1,8-cineole, linalool, borneol,  $\gamma$ -terpineol, nerol, neral, geraniol, geranial, geranyl acetate,  $\beta$ -bisabolene, and zingiberene. Ginger's essential oil is extracted by steam distillation from the root of the plant. It is often blended with other essential oils to produce many different mixtures for many different ailments. Ginger works well when blended with atlas cedar wood, blue gum eucalyptus, frankincense, geranium, lemon, lime, Roman chamomile, rose, rosemary, and sandalwood. The processing of ginger products is an important practice in the food processing industry. The demand of ginger oil is ever increasing. It has good export and domestic demand. New entrepreneurs can well ventured in to this field.

***Cost Estimation:***

Capacity	:	150 Kg/Day
Plant & Machinery	:	91 Lakhs
Total Capital Investment	:	541 Lakhs
Rate of Return	:	50%
Break Even Point	:	34%

### Instant Ginger Powder Drink

Ginger is one of the oldest and most important spices used in different kinds of food preparation. Ginger possesses a warm pungent taste and a pleasant odour, hence it has a wide use as a flavouring in numerous food preparation, beverages, ginger bread, soups, pickles and many soft drinks. There are two general types of ginger viz. fresh green ginger used for the preparation of candied ginger (in sugar syrup) and dried or cured ginger applied in the spice trade, for extracts, oleoresins and for the distillation of its volatile oil. The main application of the ginger oil is in confectionery, beverages, and baked products.

An instant beverage powder with non-polymer catechins contained at high concentration has improved flavour and taste owing to reductions in bitterness and astringency, and also provides improved flavour and taste and improved stability in external appearance after reconstituted into a beverage. The instant beverage powder contains the following ingredients (A) and (B): (A) from 0.5 to 20.0 wt % of a purified product of green ginger extract powder.

Instant Ginger Drink with Creamer made from fresh young roots, peeled and sliced, cooked in heavy sugar syrup, and then air dried. After the process, it mixed with creamer for taste variant.

The instant ginger powder in the present is comprised of a powdery concentrate composition containing non-polymer catechins, and is taken as a reconstituted beverage by dissolving it in a liquid such as deionized water or hot water. The instant beverage powder of the present may desirably be taken as a reconstituted beverage containing from 0.01 to 0.5 wt % of non-polymer catechins, the content of non-polymer catechins in the instant beverage powder is set at from 0.5 to 15.0 wt % in the present invention, but may be set preferably at from 0.5 to 12.0 wt %, more preferably at from 0.6 to 10.0 wt %, even more preferably at from 0.6 to 5.0 wt %. The setting of the content of non-polymer catechins within the above-described range makes it possible to readily digest a large amount of non-polymer catechins, and moreover, to expect the physiological effects of non-polymer catechins. The term "non-polymer catechins" as used herein is a generic term, which collectively encompasses non-epi-form catechins such as catechin, gallic catechin, catechin gallate and gallic catechin gallate, and epi-form catechins such as epicatechin, epigallocatechin, epicatechin gallate and epigallocatechin gallate. The concentration of non-polymer catechins is defined based on the total amount of the above-described eight non-polymer catechins.

The purified product is next granulated into a powder. The granulation may be conducted by either a dry method or a wet method, but for obtaining a particle size suited for dissolution in water or another drinking medium, wet granulation that granulates by using the adhesive force of water or a binder is preferred. Examples of preferred granulation methods include spray-drying granulation, freeze-drying granulation, fluidized bed granulation and tumbling



granulation. The granulation can be conducted by using two or more of these granulation methods in combination.

The instant drinks are available in a range of flavours: Orange, Raspberry, Cherry, Kiwi, Mango, Cola, Peach, Tropic, sprite, Apple, Apricot, Fruit Punch, Grape, Strawberry, Lemon, Pineapple, Ice tea Lemon, Ice tea Apple and Ice tea Peach.

The demand of ginger based beverage will ever increasing due to its health benefits. It has good export, global and domestic demand. There is good scope for new entrepreneurs.

***Cost Estimation:***

Capacity	:	600 MT/Annum (5000 Pouches (400 GMS) per day
Plant and Machinery	:	50 Lakhs
Total Capital Investment	:	348 Lakhs
Rate of Return	:	49%
Break Even Point	:	42%

### ***Information***

- ★ One Lac / Lakh / Lakhs is equivalent to one hundred thousand (100,000)
- ★ One Crore is equivalent to Ten Million (10,000,000)
- ★ T.C.I. is Total Capital Investment
- ★ All costs/amount given in INR ₹
- ★ NPCS can provide customized Detailed Project Report on all the projects
- ★ Visit us at: [www.niir.org](http://www.niir.org) Email : [info@niir.org](mailto:info@niir.org)

### Hot and Cold Fusion of Glass

Glasses are basically silicate borate compounds of different alkali metal oxide. There are two types of glass. 1. Normal glass which is used for the production of normal glass articles like sheet glass, normal bottle, tube etc. 2. Special type of glass which may be coloured or non coloured which will be used for the preparation of glass screen, glass tiles special type wash basin, optical composition required for the products of special type glass and special type furnace require for the production. Crystal glass with a 24% lead content is very heavy, almost three times the relative density of common glass. It transmits metallic resonance when tapped. With lead content of 30% glass reflects light just as a demand does. The total market of crystals in India is estimated at over Rs. 2100mn. The market was expanding in the early part of 15% a year. The high rate of growth was because of the low base. As the base expands, the rate of growth is likely to taper down but nevertheless will remain higher than the GDP growth. With the base for production taking root in India, the domestic producers are estimated to feed 60% of the market by the consumer segmentation about 20% is institutional or bank purchase and the balance 20% individual scale.

#### *Cost Estimation:*

Plant Capacity	: 6MT/Day
Plant & Machinery	: 251 Lakhs
Total Capital Investment	: 541 Lakhs
Rate of Return	: 40.16%
Break Event Point	: 49.18%

### Glass Sheet/Flat Glass/Float Glass

Many molten materials do not crystallized to their parent crystalline phases once the thermodynamic melting temperature  $T_m$  is passed on cooling. Such melts easily super cool to a temperature for below  $T_m$  and congeal to solids without any attendant discontinuous changes in volume or entropy. These solids, which are isotropic in all their properties, are known as glass. A common misconception is that all glass has same composition. A variety of organic

and inorganic material can form glass, and most of those that do exhibit a moderately sharp transition into the glassy state from the liquid. Most common inorganic glass forming systems are covalent compounds of the following elements: -Si, Ge, Sn, Pb, P, As, Sb, O, S, Se, Te. The industry is growing at 12% per annum, it is not enough to keep it the float. Per capita consumption of glass in India is only 0.4 kg as compared to Indonesia (3.5 kg).

#### *Cost Estimation*

Plant Capacity	: 200MT/Day
Plant & Machinery	: 2228 Lakhs
Total Capital Investment	: 2863 Lakhs
Rate of Return	: 45.10%
Break Event Point	: 41.84%

#### **Glass Density Hydrometer**

Glass is a brittle solid material at room temperature. It is believed that even its apparent solid state, it is actually a liquid. On heating, it first softens and then melts. Glass is manufactured at high temperatures i.e. 600°C-1300°C. Density of glass is indirectly measured by gamma radiation indirectly. Radiation impulse is converted to current and it is converted into density which is recorded in the dial thermometer and indicates the density. Glass hydrometer is largely used in pharmaceutical and other industries. Market growth is fair. Air pollution problem exists in the manufacture, which can be treated properly. Some of the raw materials are available in India while some has to be imported from Europe.

#### *Cost Estimation:*

Plant Capacity	: 1000 Units/Day for Lighter Liquids 1000 Units/Day for Heavier Liquids
Plant & Machinery	: Rs. 3.80 Lacs
Fixed Capital	: Rs. 27.75 Lacs
Working Capital/Month	: Rs. 2.01 Lacs
Total Capital Investment	: Rs. 33.78 Lacs
Turnover/Annum	: Rs. 60 Lacs

#### **Glass Industry**

The Indian glass industry has come a long way since its inception in the early 19th century. This well developed industry is large enough to cover virtually all the major facet of glass making. The glass industry in our country has accumulated capacity for in excess of domestic needs. It has, therefore, vast potential for exports which are pegged at Rs.3 billion a year at present. There is need to push the export of value added glass products. The sheet glass units are labour intensive. The float units are technology intensive and employ only the highly skilled personnel. Till recently, the country produced only

sheet and rolled glass had to import float glass. Glass manufacturing units are organised into public limited, private limited and other small units of small entrepreneurs. Any entrepreneur can well venture in this field. The growth rate of the industry was more than 10 percent. You can come in this project.

***Cost Estimation:***

Plant Capacity	: 72000 Sqm/Day
Plant & Machinery	: Rs. 1200 Lakhs
Working Cap. for 3 Months	: Rs. 91 Lakhs
Total Capital Investment	: Rs. 247 Lakhs
Rate of Return	: 85.81%
Break Even Point	: 36.67%

**Glass Sheet**

Glass is one of man's most valuable and versatile materials. About 700 different compositions are in thousands use. These are fabricated into tens of thousands of different articles that have combinations of properties for about a thousand essentially different uses. Glass is formed from those elements such as silicon, boron, phosphorous and arsenic that can be converted into glass when combined with oxygen, sulphur, tellurium or selenium. Common glasses contain about 70%  $\text{SiO}_2$ .

Sodium carbonate or soda ash decomposes, to sodium oxides as the batch of raw material melts. Consequently it acts as a flux. The carbon dioxide given off helps to stir the batch, and the oxide lowers the melting point. Limestone and dolomite act similarly as soda ash, but are used to make the glass more inert to water and to add other desirable properties. Other oxides, chiefly aluminium  $\text{FeO}$ , and cadmium act as stabilizers, increasing the strength of the glass and increasing resistance to chemical attack. Sodium and barium sulphate may be added to enhance the removal of fine particles of uncombined silica which may form a scum.

Soda lime glass is the most commonly glass, stabilizing oxides are added to decrease the solubility of the sodium silicates. This allows the production of chemically durable glasses. Calcium oxide is a cheap and effective stabilizer. Most glass bottle; window glasses and lamp bulbs are made from soda lime glasses.

The term float glass pertains to all glasses produced in a flat form, regardless of the method of manufacture. Over one third of flat glass produced in Germany is not used in its original form, but finished into other products such as automotive safety glass mirrors. By far the greatest amount of flat glass consists of soda lime glass. The main user segments of float glass are the automobiles and construction industries. The demand for float glass is, therefore, very much correlated to the growth in these industries.

It is well known fact all over the world that the best quality glass can be produced with the help of the float glass technology. There are no waves and distortion in the sheet glass manufacturing with the help of float glass technology, is the final product is free of all defects. So far in our country sheet glass is being manufactured with the help of four coul and PPG (pits burgh process) glass technologies. More or less the waves and distortions invariably remain in the sheet glass manufactured with the help of these technologies.

The glass industry represents a number of definable product segments. These are flat glass including float glass, glass containers and hollowware, vacuum glass, domestic and industrial glassware, crystal glass, fiberglass, glass wool, TV picture tube glass shells, and laboratory glass. Most of the glass products have both industrial and consumer usages. Laboratory glass is a minor constituent. So are fibre glass and glass wool.

Although the industry is growing at 12% per annum, it is not enough to keep it afloat. Per capita consumption of glass in India is only 0.4 kg compared to 3.5 kg in China, 5.2 kg in Thailand, 12 Kg in Malaysia and 2.5 kg in Indonesia.

The two main entrants in the glass industry in the recent years have been float glass (by 25%) than normal sheet glass. It also has a much higher degree of optical clarity. Other varieties include figured and wired glass.

Apart from a very large number of small players in the glass industry, there are some 76 large and medium-sized producers. Of these, 44 produce containers and hollowware with a capacity of 1.5 million tones and registered a production of 1.35 million tonnes.

Market for flat glass has always been driven by the demand for building glass and automotive glass, which in turn depend on economic growth. With the economy showing signs of revival, demand for glass will once again be back in double digits in the coming years. Thus, this sector has a good market and export potential for new entrants.

#### ***Cost Estimation:***

Capacity	:	4500 MT/Annum
Plant & Machinery	:	198 Lakhs
Cost of Project	:	335 Lakhs
Rate of Return	:	59%
Break Even Point	:	43%

#### **Optical Lenses**

Eyeglass lenses are glass or plastic optical items that fit inside eyewear frames to enhance and/or correct the wearer's vision. Due to the increasing demand for eyewear, quartz and beryl lenses were virtually replaced by glass

lenses. The convex lens was the first optical lens used in glasses to aid the correction of farsightedness, but other corrective lenses followed, including the concave lens for the correction of near-sightedness, and more complex lenses for the correction of astigmatism.

More than 80 percent of all eyeglasses worn today have plastic lenses, but plastic lenses have not always been the lens of choice. The glass lens remained dominant until 1952, when plastic lenses were introduced. The plastic lens rapidly grew in popularity because the lens was lighter and less prone to breakage. Today, the manufacture of plastic eyeglass lenses far exceeds the manufacture of glass lenses, but the process has remained much the same for both types. Plastic as well as glass lenses are produced by successive stages of fine grinding, polishing, and shaping. While the same process is used to produce lenses for telescopes, microscopes, binoculars, cameras, and various projectors, such lenses are usually larger and thicker and require greater precision and power.

Ophthalmic glass blanks are manufactured in a limited way in India in organized sector. A huge quantity of blanks is imported. At present the importers of lens blanks select the lens making units to whom they supply blanks in required quantity and the lens manufacturers return the finished lenses to the raw material supplier. Thus the small lens manufacturing units get an assured market for their readymade lenses. Most of the people are using lenses of various types very often. Thus the demand is spiralling high. Applications of optical lenses in a wide range of equipments e.g. microscopes for various needs of students, medical and technical laboratories, Photo enlargers, projectors and over head projectors are well known.

In the eyewear industry, it is estimated that 35 per cent of India's population are in need of vision correction, which may be done by surgery, laser therapy, spectacles or contact lenses. However, only about 25% of people have their vision corrected. Approximately 94 per cent of these wear spectacles, 6% wear contact lenses and 2.5% wear both. The eyewear industry is broadly divided into three categories: eyewear (Sunglasses/Frames), vision care (Contact lenses) and others (Surgical/Healthcare).

In India, eyewear is at the forefront compared to the global markets where vision care has a strong presence. A near stagnant market has been converted into one of the fastest growing industries recording a 20% growth annually. Nevertheless, in global terms the industry in India remains underdeveloped even today.

While the Optical retail business is estimated to be approximately 2,300 crore, it is anticipated that the impact of the WTO regime will result in the flow of a larger variety of brands through normal channels in the near future. It is also expected that duties will get lower over the next few years facilitating entry and variety.



There is a good scope and market potential in this sector. New entrepreneurs should venture into this field.

***Cost Estimation:***

Capacity	:	Optical Lenses 150000 Pairs/Annum Photocromatic Lenses 96000 Pairs/ Annum
Plant & Machinery	:	168 Lakhs
Cost of Project	:	256 Lakhs
Rate of Return	:	42%
Break Even Point	:	59%

### *Information*

- ★ One Lac / Lakh / Lakhs is equivalent to one hundred thousand (100,000)
- ★ One Crore is equivalent to Ten Million (10,000,000)
- ★ T.C.I. is Total Capital Investment
- ★ All costs/amount given in INR ₹
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### Diagnostic Centre

A diagnostic centre provides a wide scope for detection of ailments and affords facilities for a detailed medical check-up through diagnostic procedures. To accomplish this objective a modern diagnostic centre is well equipped with most modern instruments, which help in following the requisites measures for diagnostic purposes.

Quite a number of tests are carried out including pathological tests viz.: - Hematological test, sputum test, semen test, Urological test, stool test etc. Besides, other tests are also carried out such as: - Radiological Test (X-rays), Ultrasound Test, Electrocardiographic and Electro Encephalographic Tests, IVP Test, Gynecological Test, Endoscopic test, BP Test, Koch syndrome Test (For Tuberculosis), MMR Test, Pregnancy Test, cardiological test etc.

In a diagnostic centre desired facilities are available for attending patients through doctors, nurses, specialized doctors in their respective fields required for a thorough diagnostic check-up of diseases of their fields viz. Cardiologist for heart, Pathologist for pathological test, Radiologist for X-rays, Neurologist for Brain & Nervous system checkups, Endocrinologists for hormone test, ENT specialist for Ear, Nose, Throat ailments, Ophthalmologists/Eye Specialist for eye checkup pertaining to ocular ailments and refractive anomalies, specialist for Orthopedics etc.

Medical Diagnostic Centre is an establishment that determines the nature and circumstances of a disease condition by scientific examinations. A medical diagnostic centre constitutes an important part of the health care system. Diseases are commonly diagnosed with respect to the causative organisms, if the cause of the disease is invasion by an offending pathogen. Many disease conditions are also diagnosed by tests based on biochemical parameters using the body fluid, commonly blood, or cells and tissues of the individual. The demand of diagnostic centre is increasing day-by-day to cope-up the out growing the health-conscious patients.

Firstly, rising income and health consciousness amongst the Indian population are driving people to seek specialized care. The urban consuming

class is expected to grow from 78 million in 2001 to 250 million in 2010. India's increasingly affluent middle class is demanding access to better healthcare; many Indians are now choosing to purchase health insurance with either full or partial coverage, so a large percentage of the population can afford to receive high technology treatment. Several corporate houses have expanded into the hospital business, while leading healthcare providers such as Harvard Medical International and Cleveland Clinic have entered India through joint ventures.

Although it remains highly fragmented, the market is witnessing the rapid expansion of organized diagnostic centers adopting innovative business models. Moreover, an increasing number of diagnostic centers and tests are proving lucrative for foreign and domestic IVD manufacturers.

Diagnostic market is segmented into diagnostic test services market and diagnostic products/instruments market. An analysis of drivers explains growth factors such as increase in life-style related diseases, changing demographics, medical outsourcing, medical tourism, increasing medical insurance coverage and rising PE/VC investment. The key challenges identified include a biased import duty structure and the lack of accreditation/certification of diagnostics centres.

Looking at the increasing healthcare conscious of people in these new millenniums, new entrepreneurs should venture into this field.

***Cost Estimation:***

Capacity	:	Different types of Medical Testing
Plant & Machinery	:	72 Lakhs
Total Capital Investment	:	144 Lakhs
Rate of Return	:	35%
Break Even Point	:	55%

**Surgical Sutures Materials**

(Surgical Gut, Polyglactin, Polyglycolic Acid, Poliglecaprone, Polydioxanone, Nylon, Polypropylene, Polyester)

General classification of sutures includes natural and synthetic, absorbable and non absorbable and monofilament and multifilament. Natural materials are more traditional and are still used in suturing today. Synthetic materials cause less reaction and the resultant inflammatory reaction around the suture materials is minimized. Absorbable sutures are applicable to a wound that heals quickly and needs minimal temporary support. Their purpose is to alleviate tension on wound edges. The newer synthetic absorbable sutures retain their strength until the absorption process starts. Non-absorbable sutures offer longer mechanical support.

The absorbable sutures include the monofilamentous monocryl (poliglecaprone), Maxon (Polyglycolidetrimeethylene carbonate), and PDS

(Polyglactin) and Dexon (Polyglycolic acid). Nonabsorbable sutures comprise nylon, prolene (Polypropylene), Novafil (Polybuster), PTFE (Polytetrafluoroethylene), steel and polyester. Nylon and steel sutures can be monofilaments or multifilaments. Prolene, Novafil and PTFE are monofilaments.

Braided sutures are typically more pliable than monofilament and exhibit better knot security when the same type of knot is used. Their major advantage is that they exhibit less tissue drag, a characteristic that is especially important for cardiovascular ophthalmic and neurological surgeries. A recent source in the literature lists eight objective and three subjective parameters for suture selection based on criteria such as tensile strength, strength retention, knot security, tissue drag, infection potential and ease of tying.

So, there is good future prospect for this industry and new entrepreneur enter in this project will be successful.

***Cost Estimation:***

Capacity	: 12000 Pcs/day
Plant & Machinery	: 856 Lakhs
Total Capital Investment	: 1673 Lakhs
Rate of Return	: 42%
Break Even Point	: 38%

**I.V Cannula and Butterfly Needles**

A Cannula is a tube that can be inserted into the body, often for the delivery or removal of fluid. An intravenous cannula is a flexible tube which when inserted into the body is used either to withdraw fluid or insert medication. Cannula normally comes with a trocar attached which allows puncture of the body to get into the intended spaces. An intravenous (I.V.) cannula is inserted a vein, primarily for the administration of intravenous fluids, obtaining blood samples and administering medicines. An arterial cannula is inserted into an artery, commonly the radial artery, and used during major operation and in critical care areas to measure beat-to-beat blood pressure. The cannula is also used in an emergency procedure to relieve pressure and bloating in cattle due most commonly to their accidentally grazing wilted legume or legume-dominant pastures. They are also a component used in the insertion of the verichip.

A butterfly needle or casually a butterfly is named because of the plastic handles attached to the needle resemble butterfly wings. The butterfly needle may have a smaller diameter needle than the usual blood drawing needle, but not necessarily. It is sometimes less awkward for the blood drawer to have the flexible tubing separating the syringe. They are useful in difficult venepuncture because the handles allow much finer control of the needles. They can also be useful for a one off administration of intravenous drugs.

The demand of I.V. Cannula and Butterfly needles is increasing rapidly, so there is wide scope for new entrepreneurs.

***Cost Estimation:***

Capacity	:	Total 60,000 Pcs/Day 30,000 Pcs./Day (I.V. Cannula) 30,000 Pcs./Day (Butterfly Needles)
Plant & Machinery	:	Rs. 191 Lakhs
Total Capital Investment	:	Rs. 539 Lakhs
Rate of Return	:	42%
Break Even Point	:	43%

**Infusion Set and Blood Transfusion Set**

Infusion therapy is a type of medical treatment in which medication is delivered directly into the body via a blood vessel, the spinal cord, or a muscle. This type of treatment took place on an inpatient basis, with the patient staying in the hospital and being monitored during the course of the treatment. More commonly today, infusion therapy is used when oral therapy is not an option, for a variety of reasons ranging from swallowing disorders, which make it difficult for patients to swallow medications and food to the use of medications, which would be destroyed in the stomach and must therefore be delivered directly. This type of therapy is also used in pain management, with patients receiving pain relief through an infusion pump.

A blood transfusion is a relatively simple medical procedure during which a patient receives whole blood or one of its parts through an intravenous line. This is a tiny tube that is inserted into a vein using a small needle. A blood transfusion is a medical procedure in which blood is taken from one person and gives to another person. There are many reason for performing a blood transfusion. Blood may be required during surgical operations. Accident victims may need blood to replace the blood that has been lost. There is good demand and future scope for infusion and blood transfusion set.

So, new entrepreneurs venture into this field will be successful.

***Cost Estimation:***

Capacity	:	Total 40,000 Sets/Day 20,000 Infusion Sets/Day 20,000 Blood Transfusion Sets/Day
Plant & Machinery	:	Rs. 220 Lakhs
Total Capital Investment	:	Rs. 707 Lakhs
Rate of Return	:	50%
Break Even Point	:	40%



## Chapter 30

## HERBS AND HERBAL BASED PRODUCTS

### Herbal Cosmetics

Now-a -days in the whole world there is a turn to return towards the use of herbal products and to adopt a more natural way of life. People prefer natural food, natural medicine and natural curing practices for healthy life. Cosmetics are vital to maintain the beauty of human face and body. Herbal cosmetics are in use and practice since thousands of years in India without any after effects or side effects and are well proven and documented. The Usage of herbal cosmetics has been increased to many folds in personal care system and there is a great demand for the herbal cosmetics.

Natural cosmetics have a host of benefits. Being natural, they are considered to be quite harmless on the skin. They contain time tested ingredients with proven efficacy. A judicious combination of potent herbs can not only produce cosmetic effect but also help cure skin ailments and hair problems. The natural products- leaves, roots, fruits etc. supply several essential nutrients to the skin too. Cleansers, toners, moisturizers, face masks, creams, lotions, face packs- all are available in herbal varieties. The essential oils of certain plants can bring forth miraculous results.

Cosmetics in India have always been dominated by global brands, partly by adoption, partly by franchising and partly by imports. Imports were made through Indians traveling abroad or NRIs (non-resident Indians) coming to India. With the onset of the liberalization policies, access to and the entry of foreign brands have become easy. However, the Indian market was also served by a number of traditional cosmetics, which segment was dominated by the informal or the small industry.

The value of output of cosmetics industry (excluding toiletries) is estimated at Rs 24 bn in the organized sector. The informal sector produces about one-third by value and much higher by volume. The overall market is estimated to be of the order of over Rs 36 bn. It has witnessed a growth rate of 10 to 12% annually. Despite the downward trend in the demand of a large number of consumer products, the cosmetic industry continues to grow at a high rate basically because of the entry of new players (and new products) and globally known brands. This could also be due to the essentiality function of some of the products such as talcum powder and those having relatively low per



unit value. Teenager is the target of all brand-builders although a major user segment is the adult women starting from 20. The up-end market is expected to grow at the rate of 12% and might pick up a rate of 15% from the present market value level of Rs 24 bn. The herbal segment is growing at a faster pace riding on the piggyback of good health and absence of side effects.

There is a very good scope in this field and new entrepreneurs should venture into this segment.

***Cost Estimation:***

Capacity	:	34998 Kgs./Annum Herbal Cosmetics (7 items each 5 TPA)
Plant & Machinery	:	49 Lakhs
Total Capital Investment	:	130 Lakhs
Rate of Return	:	47%
Break Even Point	:	41%

**Aloe Vera Cultivation & Extraction**

Aloe Vera belongs to the family liliaceae and is mainly cultivated for its thick fleshy leaves. There are 300 known species of Aloe Vera in the world out of which aloe barbadensis miller is considered as the best type with 95% of medicinal properties. Aloe Vera is known by name in the Indian Languages – Ghrit Kumari, Kunvar Pathu and of course India Aloe. The plant can be processed into two basic products – gel and latex. This plant is commonly referred to as aloe juice and it also has laxative properties. Aloe Vera is full of medicinal properties & it is effective in treating various body ailments.

Cultivation of medicinal plants especially those of high value are high in demand. The wild resources of medicinal plants have depleted from their natural homes, therefore, aloe is now commercially cultivated in the United States, Japan, India and Countries in the Caribbean and Mediterranean.

The leaves of healthy and proliferous Aloe Vera plants are green and juicy. The crop is abundant. It is harvested, replanted and grown again and again. The process of harvesting, cleaning and extracting followed to obtain aloe, Aloe Vera gel and Juice.

Aloe Vera is useful in Cosmetic Industry and Medicine manufacture sector. It is commonly used as an external application on inflamed painful parts of the body. Aloe was known to the ancients having been cultivated in the island of socotra as early as at the time of Alexander Great.

Aloe Vera Gel and Aloe Vera Powder has tremendous demand in the herbal base products area. There is lot of use of Aloe Vera and Aloe Vera Gel in the field of cosmetics, medicines. It has larges used since from ancient time. There are many herbal base companies trying best to explore the market

on the base of utilization of available aloe. There are good exports as well as domestic demand of Aloe Vera products. So, any one venture in this field will be successful.

***Cost Estimation:***

Capacity	: 550 Kgs./Day (Aloe Vera Gel)
Plant & Machinery	: 75 Lakhs
Total Capital Investment	: 161 Lakhs
Rate of Return	: 48%
Break Even Point	: 44%

**Integrated Unit**

**(Herbal Hair Oils, Herbal Cosmetic, Ayurvedic Pharmacy)**

Herbal hair oil mainly comprises of oils of vegetable in origin as base and a suitable blended perfume. Vegetable oils commonly used are coconut, castor and sea some oils. To avoid rancidity of hair oils antioxidants are added in very little quantities. The hair oils may be coloured by the use of oil soluble colours. Now a day's people have special attraction for use of herbal hair oil. The ingredients used in herbal hair oil are Amla dry fruits, Mehendi leaves, Brahmi Plant, Lemon oil, Harar dry fruits, Bahera dry fruits, kapurkachari rhizome, Almond oil etc.

Herbal Cosmetics are formulated, using various permissible cosmetic ingredients to form the base in which one or more herbal ingredients are used to provide defined cosmetic benefits only, shall be called as Herbal Cosmetics. Mixtures and pastes were then used to whiten the face, a practice which remained popular till over four hundred years later.

Herbals extracts are processed for curing several remedies and serve other health prospective. In the extraction process, the herbs are smashed in a bowl to squeeze out the juice. Later the liquefied juice is mixed with essential substances to prepare the herbal extracts. Herbal extracts in liquid and other forms have proved to be panacea in the diseases like cardiac problems, digestive disorders and in mental fatigues.

**Applications**

Herbal Hair Care Cosmetics uses Henna (*Lawsonia Inermis*), Amla (*Emblica Officinalis*), Shikakai (*Acacia Concinna*), Brahmi (*Bacopa Monnieri*), Bhringraj (*Eclipta Alba*), Guar Gum (*Cyamopsis tetragonolobus*) to obtain healthy hair. Herbal Lip Care Cosmetics includes Herbal Lipsticks, Herbal Lip Gloss, Herbal Lip Balm, and Herbal lip plumper advantages over existing process/product: Aroma – mood lifting, anti-depressant, anti stress, creative thought inducing,

anxiety reducing, refreshing, stimulant, soothing, fragrant & antimicrobial. Composition has improved moisturizing effect. Herbal skin care products such as lavender silk soaps, lotions creams, body powder, lavender herbal body powder, skin care creams are well known. herbal eye care cosmetics: eye makeup, eye shadows, eye gloss, liquid eye liners herbal creams, lotions, gel, creams, aloe moisturizing hand cream, rich face and hand cream, herbal moisturizers herbal oils: herbal oils are effective for baldness, falling of hair, thinning of hair, dandruff, and irritation & itching of scalp, patchy baldness, and maintenance of fine head of hair herbal perfumes & fragrances: citrus fragrance: the light, fresh character of citrus notes (bergamot, orange, lemon, petit grain, mandarin etc.) is often combined with more feminine scents (flowers, fruits and chypre).

Ayurveda is mainly based on herbs, plants, flowers, fruits, vegetables and all vegetation that grows around us in plenty. It is our native system based on the peculiar Indian conditions. Further whatever is available on our own country is bound to be more suitable in creating good health to us rather than borrowed knowledge as well as materials. Charaka samhita stresses the same point. It is preventive, protective, health primitive and curative in nature. At the same time herbal remedies are self contained, and nutritive rendering them harmless and non toxic. This provides a constructive approach against destructive forces.

### Market Scenario

Herbal extracts have shown commercial aspects as well. Herbal extracts are cultivated all over the world and is prime name in horticulture sector. In the present, masses are drifting towards nature and several cosmetics, fashionable items and others are prepared from it. The hair oil market is huge, valued at Rs 6 bn. Due to the varied consumption habits of consumers across the country, where coconut oil and edible oil are interchangeably used, the size of the market is likely to be higher than estimated. More importantly, the market is growing at an impressive 6-7% in volume terms despite the high penetration level. The cosmetic segment primarily comprises of colour cosmetics (face, eye, lip and nail care products), perfumes, talcum powder and deodorants. All these are very small segments. The size of Indian Cosmetics Industry globally is \$ 274 billion, while that of the Indian cosmetic industry is \$ 4.6 billion. According to analysis and figures given by the Confederation of Indian Industries (CII), the total Indian beauty and cosmetic market size currently stands at US \$950 million and showing growth between 15-20% per annum. Industry sources estimate a rapid growth rate of 20% per annum.

***Cost Estimation:***

Capacity:	
Herbal hair Oil	: 200 ml Packs, 600000 Ltrs/Annum
Henna Powder	: 500 gm Packs, 300000 Kg/Annum
Face Pack	: 200 gm Pack, 60000 Kg/Annum
Cream/Paste	: 50 gm Pack, 60000 Kg/Annum
Medicine Powder	: 100 gm Pack, 60000 Kg/Annum
Medicine Tablets	: 50 gm Pack, 60000 Kg/Annum
Herbal Syrup	: 200 gm pack, 60000 Kg/Annum
Herbal Semi Solid	: 500 gm Pack, 60000 Kg/Annum
Plant and Machinery	: 147 Lakhs
Cost of project	: 737 Lakhs
Rate of return	: 43%
Break Even Point	: 62%

**Herbs Plantation (Medicinal)**

Every herbal plant have its own specific use for the production of specific drugs from specific herb. It has large enduse in the pharmaceutical industry. The only countries in the world with significant prescription sales of herbal medicines are China, India, Japan and Germany. Most sales of herbal medicine in North America and Europe are of over the country. India is richly endowed with a wide range of plant species. Many of these plants possess tremendous medicinal values and being used extensively for such purposes. Government of India has been engaged in promoting exports of herbal based products.

***Cost Estimation:***

Plant Capacity	: 20 MT/Annum
Plant & Machinery	: Rs. 5 Lacs
Working Cap. for 3 Months	: Rs. 2 Lacs
Total Cap. Investment	: Rs. 17 Lacs
Rate of Return	: 48.65%
Break Even Point	: 46.13%

## Chapter 31

### HOSPITAL, SPECIALIZED (SUPER SPECIALTY) HOSPITALS

#### Cancer Hospital

Cancer is a term used for diseases in which abnormal cells divide without control and are able to invade other tissues. Cancer cells can spread to other parts of the body through the blood and lymph systems. A multidisciplinary approach to cancer treatment is essential and this has to be made available at all Regional Cancer Centers. The services of a trained surgeon and a Clinical Oncologist are needed to plan the most appropriate treatment. Radiotherapy services are still the mainstay of treatment given the large proportion of advanced epithelial cancers in India. Given the long waiting lists and the distance that patients have to travel to reach treatment facilities, optimal strategies have to be identified.

The Cancer hospital is a comprehensive cancer care set up with all the facilities for diagnosis and treatment of all types of cancers available under one roof. The state of the art diagnostic equipment with highly qualified and experienced faculty is available in the organization.

#### Cancer Statistics of India

- ★ Every year about 85,0000 new cancer cases are diagnosed in India resulting in about 58,0000 cancer related death every year.
- ★ India has the highest number of the oral and throat cancer cases in the world. Every third oral cancer patient in the world is from India.
- ★ In males Oral, Lungs and Stomach cancers are the three most common causes of cancer incidence and death.
- ★ In females Cervical, Breast and Oral cancers are the three main causes of cancer related illnesses and death.

#### Global Scenario

India's rapid growth has brought about a 'health transition' in terms of shifting demographics, socio economic transformations and changes in disease

patterns. Healthcare, which is a US\$ 35 billion industry in India, is expected to reach over US\$ 75 billion by 2012 and US\$ 150 billion by 2017 according to Technopak Advisors in their report 'India Healthcare Trends 2008'. The sector's growth will be driven by the country's growing middle class, which can afford quality healthcare. Over 150 million Indians have annual incomes of more than US\$ 1,000, and many who work in the business services sector earn as much as US\$ 20,000 a year. If the economy continues to grow at its current rate and the literacy rate keeps rising, much of western and southern India will be middle class by 2020. Hence it is one of the imperative fields to endeavor.

***Cost Estimation:***

Capacity	:	50 Bedded Hospital
Plant and Machinery	:	5010 Lakhs
Total capital investment	:	6968 Lakhs
Rate of return	:	46%
Break Even Point	:	35%

**Hospital (200 Bedded)**

A private hospital is a place where one may get treatment from ordinary fever to a major surgery operation. As a matter of fact, no limitation has been made for the facilities available in a hospital. However, generally all private hospitals are provided with latest facilities and ultra modern machines. In a hospital surgeons, physicians, E.N.T. specialists, child specialist, eye surgeon, psychologists and sex specialist are essential.

Increasing the negligence in the govt. hospitals and overcrowding gave the opportunity to private hospitals to have a good business. Number of private hospitals began to come in light with all facilities for E.C.G., X-Ray, Laboratories, 24 hours emergency and admission facilities for ill persons, seriously injured and pregnant ladies. These hospitals can be seen well crowded as they provide good services at a smile.

There are very good scope for private hospitals in metro and small cities. So, starting a new hospital will be profitable venture.

***Cost Estimation:***

Capacity	:	200 Beds Hospital
Plant & Machinery	:	27 Crores
Total Capital Investment	:	151 Crores
Rate of Return	:	43%
Break Even Point	:	33%



**Hotel Industry (5 Star)**

The hotel industry is an important component of tourism industry. Its foreign exchange earning capacity is also high. The initiation of economic reforms in this country gave a boost to the hotel industry. The demand for rooms in hotels by foreign businessmen has increased sharply. Understandably, most Indian hotel chains are pushing ahead with their expansion plans. Perhaps the government should extend a few more sops to the total industry so that its capacity expands to keep up with the rising demand. The hotel industry deserves a few more sops because it is capital intensive, having a long gestation period, and the new tourist destination and circuits also take a long time. The hotel industries are linked to the progress of tourism industry. There is bright future of this project.

***Cost Estimation:***

Plant Capacity	: 200 Rooms
Plant & M/c.	: Rs. 3059 Lacs
W.C. for 3 Months	: Rs. 1586 Lacs
Total Capital Investment	: Rs. 1571 Lacs
Rate of Return	: 43%
Break Even Point	: 32.65%

**Five Star Hotel, Business Centre (Shopping Centre),  
P.V.R., Health Club & Banquet Hall**

Five star hotels having business center by making luxurious shops, P.V.R., health club, banquet hall is wonderful profit making venture. Hotel business is a very flourishing business these days not only in India, but it has been termed as an international hotel industry and it carries very brilliant prospects. There is a vast scope for setting up of 5 star hotels with other additions as stated above.

***Cost Estimation:***

Plant & Machinery	: Rs. 420.00 Lakhs
W.C. for 3 Months	: Rs. 140.97 Lakhs
Total Capital Investment	: Rs. 2005 Lakhs
Rate of Return	: 16.41%
Break Even Point	: 63.02%

### Jute Twine (Jute Rope) & Gunny Bag from Raw Jute

Jute fibre is obtained from the plants of *corchorus* spp. It is principally used in the manufacture of hessian, sacking cloths, bags, ropes, cords, handicrafts and miscellaneous fabrics. India is the largest producer of jute. In fact, India combined with Bangladesh produce 90% of the jute of the world. Jute bags are mainly used for storage and transportation of bulk solids like cement, fertilizers, sugar, agricultural products etc. Demand of jute products is good and new units coming up will be successful.

#### *Cost Estimation:*

Plant Capacity	:	500 Kg Twine/Day + 500,000 Gunny Bag/Day
Plant & Machinery	:	Rs. 8.25 Lacs
W.C. for 3 Months	:	Rs. 8.88 Lacs
Total Capital Investment	:	Rs. 37.73 Lacs
Production Cost/Annum	:	Rs. 42.78 Lacs
Sales Turnover	:	Rs. 67.50 Lacs

### Jute Yarn, Jute Sutli & Hessian Cloth Weaving Integrated Unit

Jute Follows cotton in world textiles consumption. It is used in the United States chiefly in a floor covering, wrapping & industrial fabrics rather than in clothing textiles. Jute twine of different qualities and thickness are used extensively in India and Abroad. Three classes of twine are made viz. Country twine, export twine and sacking twine. Country twine is utilized in India for a large variety of purpose, particularly for sewing, carpet making and for general purposes. Other twines are used in finishing nets and various type of rope making. On the other hand the softened twines can be used for packing cloth, carpets etc. It can also be used as a substitute for filare running yarn, which is usually used for reinforcement of fibre plasters. It is also used for cordage. The hessian or burlap cloth is woven of jute. This cloth is stiff & does not drape well but is some times used for inexpensive decorating fabrics such as drases or slipcovers & less frequently as garments designed

for unusual decorations & textural effects. India is at present the biggest manufacturer of jute goods. There is bright scope of jute yarn, jute sutli & hessian cloth weaving integrated unit.

***Cost Estimation:***

Plant Capacity	:	Jute Yarn 10 MT/Day, Jute Sutli 15 MT/Day, Hessian Cloth 10,000 Mtr./Day
Plant & Machinery	:	393 Lakhs
Total Capital Investment	:	690 Lakhs
Rate of Return	:	46%
Break Even Point	:	39%

**Jute Garments**

Jute Garments are gaining popularity in recent time these fashion Garments in many new and innovative design are fetching the market and their demand is increasing at a tremendous pace. The country export around 5,00,000 tonnes of jute goods in a year. As the demand of Jute Garments is increasing there exists a great scope for new entrepreneur to enter into this field.

***Cost Estimation:***

Plant Capacity	:	80 Nos./Day
Plant and Machinery	:	Rs. 45 Lacs
Cost of Project	:	Rs. 120.0 Lacs
Rate of Return	:	86%

***Information***

- ★ One Lac / Lakh / Lakhs is equivalent to one hundred thousand (100,000)
- ★ One Crore is equivalent to Ten Million (10,000,000)
- ★ T.C.I. is Total Capital Investment
- ★ All costs/amount given in INR ₹
- ★ NPCS can provide customized Detailed Project Report on all the projects
- ★ Visit us at: [www.nir.org](http://www.nir.org) Email: [info@nir.org](mailto:info@nir.org)

## Chapter 34

## LEATHER, LEATHER GOODS AND LEATHER TANNING

### Leather Tanning

Tanning is affected by treating the conditioned hides and skins with organic, inorganic or synthetic tanning agents. The most important among them are vegetable tanning materials and basic chromium sulphate. Basic salt of aluminium, zirconium, iron, formaldehyde, quinone, aliphatic sulphonyl chlorides, fish oils and synthetic polymerized materials (Syntans) are used for the production of special leathers. India is rich in cattle wealth. Buffalo calf leather is India's speciality leather. In India, there is abundance of traditional skills for the manufacture of leather products. Tanned and half-tanned leather are used for- shoe making, Belt, bags, Cycle seats, Suitcase, Decorative items, PVC leather clothing etc. The leather industry occupies a unique position in the country as one of the major export earners-presently exporting to a tune of Rs. 1250 Crores and expected to be about 1800 Crores by the end of the current plan period. Leather has also a very good export market. India is one of the biggest exporters of raw leather and leather goods to most of the European, African Middle East and Asian countries. There is a fair scope for new entrepreneurs to entre in this field.

#### *Cost Estimation:*

Plant Capacity	: 2100 sq. MT/Day
Plant & M/c	: 110 Lakhs
Total Capital Investment	: 547 Lakhs
Rate of Return	: 46%
Break Even Point	: 36%

### Leather Garments

India produces fairly sizeable quantity of clothing leather. It is used for Footwear, Gloves, Handbags and Garments etc. The Indian leather garments are by and large manufactured from sheep (Lamb) leather. The few factories that have come up in this line are indeed of excellent quality. About 50% of the leather garments exported all over the world are manufactured in Bangalore and it has fast developed as an important source for leather garments. The

Indian exporters have now a fairly good idea of what the western market needs. A number of existing units have suitably equipped themselves. Their production capacity into this field, it is believed that the Indian leather garment & industry will have a significant share in the world market for leather garments in the near future.

#### *Cost Estimation*

Plant Capacity	: 500 MT/Day
Plant & Machinery	: 4 Lakhs.
Total Capital Investment	: 277 Lakhs
Rate of Return	: 69%
Break Even Point	: 25%

#### **Leather Finishing**

Leather making in India is spread right from backward tanning unit to sophisticated modern unit in view of the versatility of leather product in modern times, the demand of finished leather is increasing day by day. The demand is more than the production. So to cater to the outgrowing demand of finished leather the imperative need of the hour is to install many more new units for finished leather.

#### *Cost Estimation*

Plant Capacity	: 1000 Pcs/Day
Plant & Machinery	: Rs. 80.00 Lakhs
Working Cap. for 3 Months	: Rs. 198 Lakhs
Rate of Return	: 35%

#### **Leather Binder (Resin Based)**

Leather binders are used to join leather to leather, crepe rubber soles to leather, felt to leather, rubber to fibres and as binders for inorganic fillers. Binders are used in Housing, furniture, carpets, book bindings, shoe and other leather based industry, disposable goods and airplanes etc. Laminated sheets are being used increasingly which increases the use of synthetic binder. Multiplayer packagings make use of synthetic binder. Consumption in pressure sensitive tapes in packaging, in medicine, in electrical products etc is increasing. Most of the consumption for synthetic binder exists in the leather and packaging industry. Demand for synthetic binder is estimated to increase at 18 % per annum. Compared to current supply and future demand, there seems to be huge scope of new investment in this project. The quality can be further improved by using polyurethane based synthetic binder or cyanoacrylate based binders. With improving availability of raw material, the scope of investment in this industry is quite bright.



*Cost Estimation:*

Plant Capacity	: 2 MT/Day
Plant & Machinery	: Rs. 25 Lakhs
W. C. for 3 Months	: Rs. 110 Lakhs
Total Capital Investment	: Rs. 171 Lakhs
Rate of Return	: 39.70 %
Break Even Point	: 41.76 %

*Information*

- ★ One Lac / Lakh / Lakhs is equivalent to one hundred thousand (100,000)
- ★ One Crore is equivalent to Ten Million (10,000,000)
- ★ T.C.I. is Total Capital Investment
- ★ All costs/amount given in INR ₹
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## Chapter 35

## LIVESTOCK FARMING & ALLIED PRODUCTS

### Poultry & Cattle Feed

Feeds are used as edible materials, which are consumed by cattle, poultry and contribute energy and/or nutrients to the cattle or poultry diet. Feeds is needed to produce cattle or poultry, which are substantial parts of the food industry. Poultry includes chickens, turkeys, ducks, guineas, pigeons, pheasant, ostrich, peafowl and swan etc. India has the largest cattle, buffalo and goat population according to latest census. About one sixth of the cattles, half of buffalo, and one fifth of goat population in world are in India.

With animal feed plant coming up in high class cities especially in Chennai, Kolkata and Mumbai who are producing top quality of poultry and cattle feeds with the resource available to these units, it is certain that animal feeds produced in India will find an instant market in the neighbouring countries. It is expected that in the next few years the animal feed industry would rank among the major industries of India and will be able to help the animal production programme in various countries around the world.

#### *Cost Estimation:*

Capacity	:	15000 MT/Annum (Cattle Feed)
	:	15000 MT/Annum (Poultry Feed)
Plant & Machinery	:	309 Lakhs
Cost of Project	:	689 Lakhs
Rate of Return	:	42%
Break Even Point	:	57%

### EMU Birds (Farming, Breeding & Meat Production)

EMU (*Dromaius novaehollandiae*) bird belong to ratite group has high economic value for their meat, eggs, oil, skin and feathers. Meat from emu is of high quality in terms of low fat, low cholesterol, gamey flavour. These birds are adoptable to varied climatic conditions. Although emu and ostrich were introduced in India, emu farming has gained much importance. Emu and ostrich features, management of these birds during chick, growing, fattening, breeding

and non-breeding stages were covered. Care and hatching of eggs, nutrient requirements, healthcare and products of emu and ostrich were also covered. Economics of emu rearing with reference to the cost of maintaining breeders cost of production of eggs and chick are covered. Commercial aspects of rearing emu has picked up in India in a big way as it promises a long-term return as compared to the initial investment. Emu bird farming is basically just like poultry. The way we look after poultry, cattle farming or goat farming, it is a similar kind of farming which is flourishing in India.

As the rearing of Emu birds has increased several fold over the years, several enterprising farmers have come together to open units for separating the various products of the bird and make them available in the market in good quantities. There are several organizations making more efforts to spread awareness of the many health benefits of consuming Emu meat and using its oil. Valued cuts are from thigh and larger muscle of drum or lower leg. Emu skin is fine and strong. Leg skin is of distinctive pattern hence highly valued. Emu fat is rendered to produce oil, which has dietary, therapeutic (anti inflammatory) and cosmetic value.

The country's first commercial emu farm was started in 1996 by an NRI named Mutiyala but it soon closed down. Mutiyala left for the US within months of starting his project because of the poor response. The reason for the growth of emu farms today is the increasing demand for the bird's meat and oil, which is believed to have medicinal properties, especially for treating joint pains and also high economic value for their eggs, skin and feathers.

Far from its native habitat in Australia, the flightless emu is leaving its footprint across the plains of India, with an increasing number of farmers commercially rearing the ostrich-size bird. From a single farm in 1996, there are today more than 900 emu farms in 14 states, with a majority of them in Andhra Pradesh and Maharashtra.

Emu (*Dromaius novaehollandiae*) and ostrich (*Struthio camelus*) are reared commercially in many parts of the world for their meat, oil, skin and feathers, which are of high economic value. The anatomical and physiological features of these birds appear to be suitable for temperate and tropical climatic conditions. These birds can be well maintained on extensive (ranches) and semi intensive rearing systems with reasonably high fibrous diets. United State, Australia and China are leading in emu and of America ostrich farming. Emu and ostrich were introduced recently into India.

Compared to ostrich, emu rearing is picking up. The Emu rearing is a promising source of considerable revenue and employment generation where the farmers would be able to sustain if a ready market was created by way of opening slaughter and processing units right here. The growth in Emu rearing would further indirectly boost the development of maize and soya crops. Emu birds are well adapted to Indian climatic conditions. Although emu farming is economical so far none of the farmers have entered in to the marketing of emu products.

Emu business can bring handsome profit in both domestic and international market in the long run. Emu farming is a complementary to agriculture and is going to be the most profitable business in the near future. Emu farming offers great scope and potential because of its supplementary income, additional employment and simplicity in operation. EMU farming in India is a huge business scheme with an enormous growth potential. New entrepreneurs should venture into this field.

***Cost Estimation:***

Capacity	:	Meat 20,000 Kgs./Annum EMU Chick 5000 Nos./Annum EMU Oil 4000 Kgs./Annum Eggs 20,000 Nos./Annum
Plant & Machinery	:	44 Lakhs
Total Capital Investment	:	759 Lakhs
Rate of Return	:	40%
Break Even Point	:	34%

**Poultry Farming**

Poultry farming has occupied an important place in the Indian economy. With the fast food culture an accepted feature, poultry farming is playing a greater role in the eatery business in India. It has emerged as the fastest growing segment in the livestock industry. Emergence of poultry as a large scale commercial enterprise took place less than 35 years ago. Poultry industry is producing a large quantity of eggs and nutritious meat for the second largest demography in the world of Indian subcontinent. It is making all efforts to develop the overseas market. The growing poultry industry in recent years has been adopted as a subsidiary or a main occupation which means promotion of economic up gradation. Poultry was a desi birds rearing industry in early fifties.

Poultry farming was greatly helped in the economic and employment upliftment of our rural population. We may hope that by the end of century, poultry farming will be recognized as one of the most significant means of eradicating rural poverty and malnutrition.

With greater awareness among consumers regarding meat quality, the demand of chicken meat will be much higher than the production.

One advantage in rearing poultry is the fact that a small area of land suffices whereas much larger area would be needed for any other livestock enterprise. Marketing of poultry products usually poses no problem as protein rich eggs and poultry meat is continuously in demand near urban areas.

There are government and other financial and technical inputs to enthusiastic investors to undertake poultry farming as a vocation. Today, layer units of 100,000 birds and above under the cage system is common.

India produces 40,000 million eggs and 1200 million broilers annually. More than 100,000 poultry farms of varying size ranging from few birds exist in rural and tribal areas of the country. There are about 123,000 poultry farmers in India. The value of output from the poultry sector is nearly Rs 330 billion.

India has emerged as the fourth largest producer of eggs and ninth largest producer of poultry meat in the world. Andhra Pradesh, Maharashtra, Haryana and Tamil Nadu are the major egg producing states. These states accounted for more than 50 per cent of the eggs produced in the country.

There is a very good scope in this sector to venture.

***Cost Estimation:***

Capacity	:	100000 Birds/Annum 150000 Eggs/Annum (Poultry Farming)
Plant & Machinery	:	8 Lakhs
Total Capital Investment	:	56 Lakhs
Rate of Return	:	42%
Break Even Point	:	47%

**Cattle Feed from Molasses & Bagasse**

In India the animal feed industry is of recent origin. There are today as many as 14 plants in the organized sector. All of them have excellent facilities for quality control and are well equipped for chemical analysis of raw materials and the finished products. The compound feeds for cattle are finding large markets all over India because of the increased effort to produce more milk products. It is anticipated that the capacity of this industry in India is likely to increase rapidly.

India has the largest cattle, buffalo and goat population according to latest census. Poultry feed is needed to produce poultry, a substantial part of the food industry. The size of food industry depends on population, which is not constant. With animals, feed plants coming up in high cities especially in Chennai, Kolkata and Mumbai. They are producing top quality poultry & cattle feed. It is expected that in the next few years the animal feed industry in India would rank among the major industries. It can be predicted that any entrepreneur into this project, will be successful.

***Cost Estimation:***

Capacity	:	9000 Ton/Annum
Plant & Machinery	:	29 Lakhs
Total Capital Investment	:	253 Lakhs
Rate of Return	:	47%
Break Even Point	:	38%

### **Goat Farming for Meat and Breeding**

Goat is one of the world's smallest domesticated livestock, have been actively managed for food and fiber earlier and longer than cattle and sheep. Goats can survive on bushes, trees, desert scrub, and vegetation that sheep and cattle are not able to consume. This dietary versatility and adaptability combined with a hardy constitution is what makes goats a primary livestock animal for most of the world. The goat; a mini-cow is multipurpose animal to provide milk meat, hide, hair (fur) and manure for soil. In hilly areas goats are also used for hauling light load. Now in rural areas goat farming plays a vital role to solve unemployment.

The economic return from keeping goats is high compared to other farming enterprises. Goats can reproduce under extreme conditions that would eliminate other species. They can live in hot, tropical climates as well as cool, temperate climates. They seem to be able to live and even flourish under desert conditions. These factors have made goats a very important domestic animal. Goat farming can be a profitable occupation of a farmer and can be fit well into mixed farming.

### **Classification of Goats**

The wild goats have four species as follows- Ibex (*Capra ibex*), Spanish Idex (*Capra pyrenacia*), Markhor (*Capra falconeri*), and Wild Goat (*Capra aegarus*).

On the basis of body weight goat breeds in India can be broadly classified as large sized (Jamunapari, Beetal, Jhakarana), medium sized (Sirohi or Marwari/Golwadi, Zalabari, Kitchi, Surti, Sangamneri, Osmanabadi, Gaddi, Ganjam, Chegu) and small sized (Bengal types, Assam hill goat). The scientific name of domestic goat is *Capra hircus aegagrus*.

### **Advantages of Goat Farming / Utility of Goats**

- ★ The goat is a multi-purpose animal producing meat, milk, hide, fiber and manure. In hilly areas, goats are also used for hauling light loads.
- ★ Goats have very few demands of housing and management. They hardly need separate housing and happily share their homes with their owners or his other livestock.
- ★ Goats can be raised by landless agricultural labourers, ladies and children because they can thrive well on variety of leaves, shrubs, bushes, kitchen waste etc.
- ★ Goat farming can be a profitable occupation for a farmer and can fit well into mixed farming.

- ★ Goats are cheaper to maintain, easily available and have a friendly disposition.
- ★ Goats are capable of adapting to various agro-climatic conditions ranging from arid dry to cold arid to hot humid. They can be raised in plains, hilly tracts, sandy zones and at high altitudes.
- ★ Goats are more tolerant to hot climate than other farm animals.
- ★ Goats suffer from fewer ailments than other large animals.
- ★ Goats are called the foster mother of man, as their milk is considered better for human nutrition than other species of livestock. Milk is cheap, wholesome, easily digestible and nutritious.
- ★ Goat milk is finer than cow milk i.e. the fats and proteins are present in a finer state and are more easily digestible, especially by children and invalids.
- ★ Goat milk has lesser allergic problems than other species of livestock.
- ★ Goat milk is used as ayurvedic medicine for persons ailing with asthma, cough, diabetes etc. And has higher buffering qualities and this enhances its value for patients suffering from peptic ulcers, liver dysfunction, jaundice, billiard disorders and other digestive problems.
- ★ Goat hide is used for the manufacture of leather products.
- ★ Goat hairs are used for the manufacture of rugs and ropes.
- ★ Pashmina shawls, Mohair and Kashmiri carpets are in great demand and are sold at very high prices.
- ★ Goat manure is 2.5 times richer in nitrogen and phosphoric acid than cow manure.

### Market Scenario

The world population of goats is approximately 674 million, of which 94% are found in the developing countries. Africa and Asia account for about 81% of the total population in the developing countries, including a bewildering variety of breeds. Goat rearing is the backbone of economy of small and landless farmers in India. It is an insurance against crop failure and provides alternate source of livelihood to farmers all the year round. Goats play an important role in income generation, capital storage, employment generation and improving household nutrition.

Goats are among the main meat-producing animals in India, whose meat (chevon) is one of the choicest meats and has huge domestic demand. Besides meat, goats provide other products like milk, skin, fibre and manure. Goats are important part of rural economy, particularly in the arid, semi-arid and mountainous regions of the country with more than 124 million population.



The largest amount of goat milk is produced in India, followed by Bangladesh and Sudan. China has the largest total number of goats in the world, but they are mainly kept for meat production.

***Cost Estimation:***

Capacity	: 1000 Goats
Plant and Machinery	: 6 Lakhs
Total capital Investment	: 115 Lakhs
Rate of return	: 47%
Break Even Point	: 33%

**Shrimp Farming (Breeding in Sea Water)**

Shrimp farming has developed widely through the desire to provide for increasing demands and continues to grow economically despite any environmental, ecological, and social disadvantages. A shrimp farm is an aquaculture business for the cultivation of marine shrimp. Shrimp is enormously popular seafood in the developed nations of the world, including the United States, the European Union, Japan, and Australia. Shrimps belong to the order Decapoda, a crustacean order. All decapods possess a full carapace or "head shield" and eponymously, five pairs of walking legs. Their first three pairs of thoracic appendages are modified into "maxillipeds" or feeding legs. Shrimps are distinguished from the other decapods by having the front-most section of the abdomen about the same size as the rest of the sections and by having five pairs of abdominal appendages, or pleopods, adapted for swimming. There are more than 3,000 living species of shrimp worldwide.

**Advantages of Shrimp**

Shrimp is high in calcium iodine and protein but low in food energy. A shrimp based meal is also a significant source of cholesterol and considered healthy for the circulatory system because the lack of significant levels of saturated fat in shrimp means that the high cholesterol content in shrimp actually improves the ratio of LDL to HDL cholesterol and lowers triglycerides. Shrimp are also good source of cardio-protective omega-3 fatty acids, noted for their anti-inflammatory effects and ability to prevent the formation of blood clots.

**Harvesting and Handling**

Two methods of harvesting are generally practiced on farms. These are either by draining the pond and catching the shrimp in a bag net or by netting the shrimp within the pond. For the first method of harvesting, ponds and outlets should be appropriately designed and be able to completely drain the pond within 4-6 hours. A bag net should be able to be fixed to the outlet to collect the shrimp that are carried by the out flowing water. The best time

for harvesting is early in the morning and it should be completed before mid-morning. In ponds that can only be drained at low tide, the harvest should be conducted whenever possible. The shrimp should be regularly removed from the harvesting bag in small quantities to prevent damage.

When netting the shrimp within the pond either a small electric net or a large seine net can be used. The water level of the pond should be reduced to 0.5-0.75 m deep and workers will need to go inside the pond for netting. This method is less advantageous the pond bottom will be disturbed, thus causing contamination of the shrimp. It is also slower and may take a long time to complete. With either method, it is necessary to hand-pick the remaining shrimp in the pond, after the pond is drained. The harvested shrimp can be quickly killed by giving them a temperature shock (dip in iced water) to prevent damage and to improve storage.

### Global Scenario

The global shrimp industry has experienced phenomenal growth over the last twenty two years generating more than 730,000 metric tons of farm cultured product annually. This industry represents a market value exceeding US\$ 3.7-4.5 billion (\$5.00-\$6.00/kg) ex-farm. World production of shrimp, both captured and farmed, is about 8 million tons, of which about 60% enters the world market. Shrimp is now the most important internationally traded fishery commodity in terms of value.

Therefore the scope for Shrimp farming is very bright. An entrepreneur venturing into this project will find it very lucrative.

### *Cost Estimation:*

Capacity	:	400 MT shrimp/Annum in two crops Shrimp farming in 35 hectares, 20 ponds, each pond-1 hectares
Plant and Machinery	:	560 Lakhs
Total Capital Investment	:	1570 Lakhs
Rate of return	:	40%
Break Even Point	:	40%

## Chapter 36

## MAIZE, CORN AND ITS BY-PRODUCTS

### Maize Processing (Maize Starch, Liquid Glucose, Gluten, Dextrose)

The maize also called "Corn or Indian Corn" is widely cultivated in India. Maize ranks high among the four or five principal cereal crops of the world. Maize is utilized in more diversified ways than any other cereal. Starch is the main product of a maize processing unit, which is consumed in various other industries like food, pharmaceuticals, textiles, paper, hotels and restaurants, etc. The other products include Gluten, Germ, Fiber (husk) and Corn Steep Liquor. Gluten has great demand in animal feed industry because of its high protein content (70%). Germ is expressed to extract germ oil which is low cholesterol containing edible oil. Fiber, mainly the husk, is used by animal feed manufacturers. It has demand in wet form itself for animal feed. Corn Steep Liquor is one of the substrates for culture media for manufacturing of antibiotics and other microbial production systems.

### Applications

Besides food, maize and maize products have numerous industrial uses such as in adhesives, explosives and soaps, and for textile sizing, etc. Maize starch is employed in the manufacture of asbestos, ceramics, dyes, plastics, oil cloth, linoleum, paper, and paper boards, and in textiles, mining, deep oil drilling, and cosmetic and pharmaceutical industries. The derivatives of maize starch include glucose or corn syrup, corn sugar, dextrin, and industrial alcohol, which is employed in different industries. The grain is used for making various alcoholic beverages. Corn oil obtained from the embryo (i.e. young plant in its earliest stages of development) is used in paints, varnishes, rubber substitutes and as a cooking medium. Maize starch is extensively used as a sizing material in the textile and paper industries. In the food industry, it is used in the preparation of pies, puddings, lad dressings and confections. The further use of the products of maize are Dextrose (used in baking, beverage and canning industries), Maize Starch Syrup (used in the food processing industry, chiefly in confectionery), Pop corn and the various by products of maize are maize oil, seen, steep water etc.

### Global Demand

The viability of a maize processing plant depends upon the availability and uninterrupted supply of raw material to the unit. On an average, a unit with a crushing capacity of 100 MT/ day will require about 50000 MT of maize per year (assuming 300 days of operation of the plant). Hence, the availability of raw material is one of the important considerations in deciding the location of maize processing unit. Maize is the most widely grown crop in the Americas with 332 million metric tons grown annually in the United States alone. Approximately 40% of the crop 130 million tons is used for corn ethanol, transgenic maize (Genetically Modified Corn) made up 85% of the maize planted in the United States in 2009. While natural maize varieties grow to 12 meters (39 ft) tall, most commercially grown maize has been bred for a standardized height of 2.5 meters (8.2 ft). Sweet corn is usually shorter than field corn varieties. The starch is the main product of a maize processing unit, which is consumed in various other industries like food, pharmaceuticals, textiles, paper, hotels and restaurants, etc. The Starch industry in India is thus poised to rapid strides once again keeping behind the impacts of the global recession during recent years. The target of indigenous production of over 6 million MT will require the Indian Starch industry to increase their production during the next ten years. To meet the growing demand, per hectare yield of maize is estimated to rise to 2.36 MT as against 1.7 MT currently by the end of 2020.

Therefore the scope for this product is very bright. An entrepreneur venturing into this project will find it very lucrative.

### *Cost Estimation:*

Capacity	:	200MT Maize processed/day
		Starch 133 MT/day
		Glucose 20 MT/day
		Gluten 18 MT/day
		Germ 8 MT/day
		Fiber 4MT/day
		Steep Water 12MT/day
Plant and Machinery	:	3175 Lakhs
Total capital investment	:	7310 Lakhs
Rate of return	:	33%
Break Even Point	:	40%

### Starch and Allied Products from Maize

(Starch, Liquid Glucose, Dextrose Monohydrate, Dextrose Anhydrous, Sorbitol and Vitamin – C)

Starch is a group of polysaccharides, composed of glucopyranose units joined together by-glucosidic linkages. It conforms to the molecular formula,  $(C_6H_{10}O_5)_n$ , where  $n$  varies from a few hundred to over one million. Starch is found as the reserve carbohydrate in various parts of plants and is enzymatically broken down to glucose to other carbohydrates according to the metabolic needs of the plants.

Industrially, starch is broadly divided into two types viz., natural and modified. Natural starches also designated as unmodified starches or simply starches are obtained from grains such as sorghum, from roots like potato, tapioca and arrowroot, and from the pith of the stems of certain palms such as sago. They are further classified into cereal starches and root starches. The characteristics of the natural starches are changed by chemical or enzymatic action and the products of these reactions are termed modified starches. This group includes dextrins, acid-modified starches, oxidized starches, starch esters, starch ethers, dialdehyde starches, and cationic starches.

The cereal starches, such as maize, wheat, rice and sorghum, are recovered by several processes, of which the wet milling is by far the most important. Other starches include that of potato & tapioca plant.

Physical and chemical properties of starch vary according to the raw material from which it is derived. Starch has many industrial applications in industries like textile, food, paper, pharmaceutical, in the manufacture of glucose and dextrose by hydrolysis, manufacture of modified starches, etc.

There are many units as at present in the country producing starch from Maize and three units producing starch from Tapioca in the organized sector. The capacity for starch from Maize accounts for more than 80 per cent of the installed capacity in the organized sector.

As against the organized sector, there are a number of units in the small and cottage sector producing starch mainly from tapioca.

As regards glucose it is produced in solid as well as liquid form. The production of glucose is not possible in the small sector and therefore its production is not as widely spread as that of starch. Eight units manufacturing starch in the organized sector also produce liquid glucose simultaneously.

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As regards glucose it is produced in solid as well as liquid form. The production of glucose is not possible in the small sector and therefore its

production is not as widely spread as that of starch. Eight units manufacturing starch in the organized sector also produce liquid glucose simultaneously.

There is an ample space for new entrepreneurs to venture into this field.

***Cost Estimation:***

Capacity	:	30000MT Maize Starch 600 MT Liquid Glucose 3900 MT Dextrose Monohydrate 300 MT Dextrose Anhydrous 17100 MT Sorbitol 150000 Kg/Annum Vitamin C
Plant & Machinery	:	780 Lakhs
Cost of Project	:	2590 Lakhs
Rate of Return	:	42%
Break Even Point	:	56%

**High Fructose Corn Syrup (HFCS)**

Fructose is a simple monosaccharide found in many foods. It is a white solid that dissolves readily in water. Honey, tree fruits, berries, melons and some root vegetables, contain significant amounts of the fructose derivative sucrose (table sugar). Sucrose is a disaccharide derived from the condensation of glucose and fructose.

Crystalline fructose and high-fructose corn syrup are often confused as the same product. Crystalline fructose, which is often produced from a fructose-enriched corn syrup, is indeed the monosaccharide. High-fructose corn syrup, however, is usually considered to be a mixture of nearly equal amounts of fructose and glucose.

High fructose corn syrup provides sweetness intensity equivalent to sugar. High fructose corn syrup can replace sugar in one-for-one proportions. The sweetness profile of high fructose corn syrup enhances many fruit, citrus and spice flavors in beverages, bakery fillings and dairy products.

High fructose corn syrup is composed of either 42 percent or 55 percent fructose, with the remaining sugars being primarily glucose and higher sugars. In terms of composition, high fructose corn syrup is nearly identical to table sugar (sucrose), which is composed of 50 percent fructose and 50 percent glucose. Glucose is one of the simplest forms of sugar that serves as a building block for most carbohydrates. Fructose is a simple sugar commonly found in fruits and honey.

High fructose corn syrup is used in foods and beverages because of the many benefits it offers. In addition to providing sweetness at a level equivalent to sugar, High fructose corn syrup enhances fruit and spice flavours in foods such as yogurt and spaghetti sauces, gives chewy breakfast bars



their soft texture and also protects freshness. High fructose corn syrup keeps products fresh by maintaining consistent moisture.

The industry responses towards substitution of sugar by high fructose corn are positive provided

- (a) it does not interfere with the product quality;
- (b) regular supply of HFS is ensured;
- (c) its use offers a price advantage over sugar;
- (d) it does not change colour on heating;
- (e) preservative qualities for the products is as good as in the case of sugar;
- (i) there is no objection in using HFS by FPO or other food related enforcement agencies.

HFS can replace sugar in industrial and domestic applications. Among industries, the major consuming sectors include bakery, confectionery, processed foods, beverages, soft drinks, ice creams, baby foods.

Now-a-days the demand for HFCS is increasing day by day, so there is wide scope for new entrepreneurs to venture into this project.

***Cost Estimation:***

Capacity	:	37500 MT/Annum (High Fructose Corn Syrup) 15000 MT/Annum (Gluten)
Plant & Machinery	:	2314 Lakhs
Cost of Project	:	3430 Lakhs
Rate of Return	:	46%
Break Even Point	:	33%

**Corn Processing Plant (For Glucose Syrup & Fructose)**

Glucose Syrup is a clear, colourless, viscous solution making it compatible with the physical properties desired in the end products chemically, glucose syrup has functional properties such as high fermentability, viscosity, humectancy – hygroscopicity, sweetness, colligative properties and its role in maillard's reaction. Glucose syrup is one of the main products of photosynthesis and starts cellular respiration in both bacteria and archaea.

Fructose is a simple monosaccharide found in many foods. It is a white solid that dissolves readily in water. Honey, tree fruits, berries, melons, and some root vegetables, contain significant amounts of the fructose derivative sucrose. Sucrose is a disaccharide derived from the condensation of glucose & Fructose.

Fructose corn syrup is a sweetener made from corn and can be found in numerous foods and beverages on grocery store shelves. High fructose corn syrup is composed of either 42 or 55 percent fructose with the remaining sugars being primarily glucose and higher sugar. In terms of composition, high fructose corn syrup is nearly identical to table sugar, which is composed of 50 percent fructose and 50 percent glucose. Glucose is one of the simplest forms of sugar that serves as a building block for most carbohydrates. Fructose is a simple sugar commonly found in fruits and honey. High fructose corn syrup is used in foods and beverages because of the many benefits it offers. In addition to providing sweetness at a level equivalent to sugar, high fructose corn syrup enhances fruit & spice flavours in foods. Such as yogurt and spaghetti sauces, gives chewy breakfast bars their soft texture and also protects freshness. Fructose corn syrup keeps products fresh by maintaining consistent moisture.

In Indian food market is poised to grow two fold by in the coming years. At a compound annual grow rate of 4.1%. The steady growth of the Indian economy & the improving life style of Indians have been instrumental in this growth.

So, there is good scope in future for these type of plants.

#### *Cost Estimation:*

Capacity	:	42000 MT/Annum (Corn Processing) 125 MT Glucose Syrup Per Day. 125 MT Fructose Per Day.
Plant & Machinery	:	430 Lakhs
Total Capital Investment	:	1 Million
Rate of Return	:	39%
Break Even Point	:	46%

#### *Information*

- ★ One Lac / Lakh / Lakhs is equivalent to one hundred thousand (100,000)
- ★ One Crore is equivalent to Ten Million (10,000,000)
- ★ T.C.I. is Total Capital Investment
- ★ All costs/amount given in INR ₹
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## Chapter 37

### MATERIAL HANDLING EQUIPMENTS AND BELT CONVEYORS

#### Hydraulic Hoses and Clamping

Hydraulic hoses are mostly used in the supplying of water in the field of agriculture and fire brigade etc. Basic raw materials, which needed to manufacture hoses, are available in India. Manpower is cheaply available in our country. Along hydraulic hoses, clamps are needed. Clamps are needed for connecting the hydraulic hose. Clamps are made from metallic sheet by the application of mechanical press. There is good market growth of hydraulic hose. It has good market demand. There is little environmental which is prevented by taking proper step. Any new entrepreneur may enter into this production field.

#### *Cost Estimation :*

Plant Capacity	: 198 Meters/day (hose pf I.D. =10 mm)
Plant and Machinery	: Rs. 34 Lakhs
W.C. for 3 months	: Rs. 28.39 Lakhs
Total Capital Investment	: Rs. 1Crore
Rate of Return	: 44.5%
Break-Even Point	: 64.6%

#### Conveyor Belting

Rubber belting are mainly used for two purposes namely, conveying and transmission. Conveyor belts are used for conveying various items such as coal, ash, ore, grain, sand, packed goods and other industrial inputs and outputs. They are used in elevators also employed for lifting the passengers at railway stations and airport etc. Conveyor beltings are produced in long lengths, are wide and run at slow speeds over large rollers. Transmission belts are used for knives from the electrical motor or diesel engines to machine in operation for production. It is only used on the flat plies of different sizes and specifications to confirm the efficient load factors etc.

India manufacture belts upto 1500 mm width. The quality of the product is also satisfactory. Inspite of that some special types of rubber Convoyer Belts are being imported. There is good scope for new investment in this field. Any entrepreneur can invest in this project.

***Cost Estimation***

Plant Capacity	: 400 MT/Day
Plant & Machinery	: 106 Lakhs.
Total Capital Investment	: 389 Lakhs
Rate of Return	: 30%
Break Even Point	: 48%

**Automatic Fan Belts**

India is one of the leading countries for rubber products. Fan belts are essentially used in automobile sector to transmit the power from one pulley to another pulley. The belt which transmits power is called power transmission belt. The production of fan belts started in India since long back. It is being produced in large and small scale sector both. At present, there are about 16 units in the organised sector and many units in the small-scale sector manufacturing fan belts in India. The production has increased continuously during last decades growth rate of 10.29 percent per annum. The demand for fan belt in future will increase with the increase in the growth of their main endues segment i.e. industrial sector and automobile industry. The industry sector is growing at a quite good rate. So there is good scope for new investment in this industry. You can come in this field.

***Cost Estimation :***

Plant Capacity	: 200 Kgs/Day
Plant & Machinery	: Rs. 13.5 Lakhs
Working Cap. for 3 Months	: Rs. 14.1 Lakhs
Total Capital Investment	: Rs. 44.4 Lakhs
Rate of Return	: 45.43%
Break Even Point	: 54.42%

**Conveyor Rollers/Idlers**

Mechanical conveying is the most widely used form of materials handling in industry. Although a large number of devices are available, most systems conform to the basic elements in which belts, chains, or moving flights are used to move materials.

Mechanical conveyor has advantages in terms of the ability to effect accurate control in the monitoring of material from one process to another. Further, by careful selection of construction materials, it is possible to design systems to meet a wide variety of operating conditions including corrosive environments and extremes of temperature.

Belt conveyors are the mostly used and versatile mode of mechanical conveying systems. These are able to handle larger mass over longer distances and at a lower cost than most forms of conveying system. A belt conveyor is an endless length of flexible material stretched between two drums and supported at intervals. The importance of conveyor belt idler rolls within materials handling has led to the development of shell tubing and bearings specially designed for idler rolls. It is therefore reasonable to expect idler manufacturers to utilize these components.

However, the life and performance of these components in the finished idler roll will be largely dependent upon the design of the roll, the methods of manufacture and the fits and tolerances employed.

The power absorbed by conveyor idler rolls is an important factor governing the selection of items such as motors, gearboxes, belting etc.

Conveyor idlers are generally manufactured in steel with bright bar shaft, single piece frame fitted with bearings for carrying, impact, and return rollers. Conveyor belt idlers are a vital component of the economic development of the country. It is critical to the development of infrastructural sectors, such as coal and other minerals, irrigation and power, ports, steel, fertilizers, road construction, urban development and the like.

India is fast emerging as a global manufacturing hub. India has all the requisite skills in product, process and capital engineering, owing to its long manufacturing history and higher education system. India's cheap, skilled manpower is attracting a number of companies, spanning diverse industries, making India a global manufacturing powerhouse. Thus the market for conveyor belt idler in the coming years is very bright as industries will cater the need for material handling. New entrepreneurs should venture into this field.

***Cost Estimation:***

Capacity	: 7500 MT/Annum
Plant & Machinery	: 77 Lakhs
Cost of Project	: 327 Lakhs
Rate of Return	: 42%
Break Even Point	: 75%

**Chicken/Mutton (Sheep Meat) Processing**

Meat is a good source of high quality and readily digestible proteins, fats, phosphorus, iron and Vitamins. Livestock and poultry are the main sources of meat and meat products. Poultry industry has emerged as an important supplementary occupation of the farming community. The product has a very good market potential and its demand is increasing rapidly and is expected to be multi-fold in the near future.

***Cost Estimation:***

Plant and Machinery	:	Rs.14 Lakhs
Project Cost	:	Rs.153 Lakhs
Rate of Return	:	62.72%

**Pork Products**

Meat processing industry is one of the growing industries among the food products. Various pork Products are used as nutritious meat and food products. It may be used as nitrogen sources. Demand is increasing of processed meat around 10-15% per annum in Europe. In India it has demand in the defence, specific hotels and in advanced Society. In India demand of fresh meat is increasing 5-8% per annum. There is very good scope for exporting of processed meat. There is bright scope for new investment. Any entrepreneur can enter in this field.

***Cost Estimation:***

Plant Capacity	:	5.00 MT/day
Plant & Machinery	:	96 Lakhs
Cost of Project	:	494 Lakhs
Rate of Return	:	48%
Break Even Point	:	33%



### Rock Wool Base Slag

There has been a little war going on out there b/w silicon and titanium, both metallic components of the sands around the world. Not long ago, the very year, the commonwealth scientific and industrial research organization of Australia, uncovered the excellent filtration properties of what they called 'nano-porous' titanium dioxide molecules. There will gradually replace silicon sand as filtration medium in many applications in the near future- especially where pollution control is improved, quite like aluminium is very slowly ousting steel from the latter's smaller bastion, Aluminium titanate has been proven to be a better refractory material in die-casting applications, as compared to calcium silicate and fused silica, which are conventionally used. If the cost of these three applications are to be compared, it is obvious that silica and calcium oxide are much more cheaper than alumina & titania. There is demand of rock wool in our country of about more than 1500 MT per annum. Increase in demand is about 18% per annum. In future demand of rock wool will increase by 2% per annum from the present demand.

#### *Cost Estimation:*

Plant Capacity	: 1 MT/Day
Plant & Machinery	: 18 Lakhs
Total Capital Investment	: 63 Lakhs
Rate of Return	: 50.99%
Break Event Point	: 46.13%

### Hydraulic Hoses for Heavy Earth Movers

Hydraulic hoses are largely used in the supplying of water from one place to another place, in the agriculture in the fire brigade, in the civil construction area etc. There is wide varied diameter are used in the manufacturing processes of hydraulic hose. It should not corrosive or not attached the human body any way. It should work at minimum temperature 50°C.

The basic raw materials used are (1) wires and (2) fiber reinforced rubber. There is good market growth of hydraulic hoses and market demand is meet up by indigenous production. There is almost no environmental pollution

problem. Any new manufacturer may enter into the production will be successful if he manufacture quality product with economic price. There is good scope for this business days to come.

***Cost Estimation:***

Plant Capacity	: 150000 Meter/ Annum
Plant & Machinery	: 18.77 Lacs
Cost of project	: 54 Lacs
Rate of Return	: 37.92%
Break Even Point	: 55.32%

**Hydraulically Regulated Door Closer**

Door closers are very commonly seen in most of the modern residential houses, office building, hospital, hotels & restaurants, Railway station and almost all the modern buildings. Door closers are connected with door case and the door top when the door is opened by the pull/push of the entrant by application of force on the door handle, the door automatically closes with out noise if the door is provided with a door closer device. The demand for door closer is totally depends upon new building and house. In India, the demand for houses is forever increases; automatically door closer demand is also forever increase. The new entrepreneur can well venture in this field and get good profit.

***Cost Estimation:***

Plant Capacity	: 20 Pcs./Day
Plant and Machinery	: Rs. 6.0 Lacs
W.C. for 3 Months	: Rs. 5.5 Lacs
Total Capital Investment	: Rs. 21.3 Lacs
Rate of Return	: 45.07%
Break Even Point	: 52.81%

**Forging on Open Die Hammers**

Forging is the name for processes whereby the work piece is shaped by compressive forces applied through various dies and tools. It is one of the oldest metalworking operations. Forging was first used to make jewellery, coins, and various implements by hammering metal with tools made of stone.

Forging may be done at room temperature (cold forging) or at elevated temperatures (warm or hot forging, depending on the temperature). Because of the higher strength of the material, cold forging requires greater forces, and the work piece materials must have sufficient ductility at room temperature. Cold-forged parts have good surface finish and dimensional accuracy. Hot forging requires smaller forces, but dimensional accuracy and surface finish are not as good. Forgings generally require additional finishing operations.

such as heat treating to modify properties and machining for accurate finished dimensions.

The forging process can create parts that are stronger than those manufactured by any other metalworking process. This is why forgings are almost always used where reliability and human safety are critical. Forging parts are normally component parts contained inside assembled items such as airplanes, automobiles, tractors, ships, oil drilling equipment, engines, missiles and all kinds of capital equipment - to name a few.

Forged parts vary in size, shape and sophistication - from the hammer and wrench in toolbox to close tolerance precision components. Some of the largest customer markets include: aerospace, national defense, automotive, and agriculture, construction, mining, material handling, and general industrial equipment. Even the dies themselves that make forgings (and other metal and plastic parts) are forged.

Open-die forging can produce forgings from a few pounds up to more than 150 tons. Called open-die because the metal is not confined laterally by impression dies during forging, this process progressively works the starting stock into the desired shape, most commonly between flat-faced dies. In practice, open-die forging comprises many process variations, permitting an extremely broad range of shapes and sizes to be produced. In fact, when design criteria dictate optimum structural integrity for a huge metal component, the sheer size capability of open-die forging makes it the clear process choice over non-forging alternatives. At the high end of the size range, open-die forgings are limited only by the size of the starting stock, namely, the largest ingot that can be cast. Practically all forgeable ferrous and non-ferrous alloys can be open-die forged, including some exotic materials like age-hardening super alloys and corrosion-resistant refractory alloys.

The Indian forging industry meets the major requirements of steel forgings for the automobile industry. There is a very good potential for export of steel forgings.

***Cost Estimation:***

Capacity	:	3000 MT/Annum (Steel forging various grade)
Plant and Machinery	:	1211 Lakhs
Cost of Project	:	1843 Lakhs
Rate of Return	:	42%
Break Even Point	:	55%

## Chapter 40

### MEDICAL DISPOSABLE PRODUCTS

#### Disposable Plastic Syringes

A plastic syringe is a cylindrical tool used for many purposes, from medicine to mechanics, to arts, crafts and refilling inkjet printer cartridges. Disposable plastic syringes are a great innovation in the field of medical equipment. Disposable needle is widely used by doctors for injection purpose with the help of syringes. A disposable plastic syringe is one of the fastest ways to administer life saving drugs and vaccinations to a patient. The major advantage of using disposable syringes is that no infection is transmitted since the injection is disposed off immediately after use. With the increase in population in our country, requirement of medicine and injections have increased too many folds.

A disposable syringe made of plastics, for medical purposes, consisting of a piston provided with a plunger shaft and a barrel provided at the bottom with a tapered chuck for the attachment of a cannula needle, in which the plunger shaft is guided in the barrel at a distance from the barrel wall, and the piston is releasably attached to the plunger shaft. These syringes typically come with measurements clearly marked (such as 1ml, 2ml, 5ml etc) to make sure the patient receives the proper dosage. The hypodermic needles are normally made from a stainless-steel tube through a process known as tube drawing where the tube is drawn through progressively smaller dies to make the needle. The end is bevelled to create a sharp pointed tip letting the needle easily penetrate the skin. The diameter of the needle is indicated by the needle gauge. Various needle lengths are available for any given gauge. Disposable needles are embedded in a plastic or aluminium hub that attaches to the syringe barrel by means of a press-fit or twist-on fitting. These are sometimes referred to as "Luer Lock" connections. The main machinery used for the production of disposable syringes are injection moulding machine, injection moulds, assembling devices, foil welding machines to name a few.

Plastics remain at the forefront of medical innovations. The Indian market is expanding in all directions as a result of better affordability, greater health consciousness and expanding medical service institutions. With a population of 1.15 billion, India will need to at least 2 million beds in the next 10 years

in order to attain a modest target of 2 per 1000 of population. With a total healthcare value of USD 400 billion, the potential for Medicare equipment is, indeed large. The healthcare sector is one of the most challenging and fastest growing sectors in India. Revenues from the healthcare sector account for 5.2 per cent of the GDP, making it the third largest growth segment in India.

According to McKinsey & Co. a leading industrial and management consulting organization, the Indian healthcare sector, including pharmaceutical, diagnostics and hospital services, is expected to more than double its revenues to Rs 2000 billion by 2010. Expenditure on healthcare services, including diagnostics, hospital occupancy and outpatient consulting, the largest component of this spend is expected to grow more than 125% to Rs 1560 billion by 2012 from Rs 890 billion now. The disposable syringes market has now self-destructing or auto-disable (AD) syringe as a safe bet against re-use and spread of HIV, hepatitis and other infections. The national immunization policy has adopted the non-reusable, self-breaking syringes, though many States are yet to follow suit for the curative injections.

With the development of pharmaceutical industries the use of syringes and disposable needles will also develop. About 70% pharmaceutical industries are in small-scale sector. Disposable syringes are becoming more popular in the medical world due to its lower cost and higher accuracy. Plastic can be used in place of metal without any problem. The procedure is also relatively easy and cheaper. Besides growing market in our own country there is great potential for the export to nearby countries. Apart from the electronic instruments and major equipment, substantial progress has been registered in the area of a number of medical accessories and consumables. These include disposables - syringes, blood bags, cannulae, IV fluid sets, gloves. In most of these items, while the demand is increasing fast, India is becoming increasingly self-sufficient. Fairly large quantities are also exported. The market for non-premium equipments, appliances and disposables is, however, dominated by the domestic manufacturers, while foreign suppliers and Indian companies with foreign alliances dominate the high-end hi-tech medical equipment and appliances. Among the leading providers of advanced products are Siemens, GE, Philips Medical Systems, Toshiba, Hitachi and Boston Scientific.

There is a large untapped potential in this sector. Nonetheless, it is crystal clear that with the fast commercialization process of the sector and upgradation of medical facilities, the potential is sky high.

#### *Cost Estimation:*

Capacity	:	22500000 Nos. 5 MI Size/Annum 22500000 Nos. 10 MI Size/Annum
Plant & Machinery	:	636 Lakhs
Cost of Project	:	837 Lakhs
Rate of Return	:	46%
Break Even Point	:	42%



### **Blood Bags**

Blood bag is a disposable bio-medical device used for collection, storage, transportation and transfusion of human blood and blood components. The system consists of a single or multiple bag connected with tubing's, needle, needle cover, clamp etc. The Blood Bags are made of plastic-material, which are compatible with blood.

Plasticized-PVC blood bags have been used since the 1950s for the collection of whole blood, the processing of this into plasma, platelets etc., and storage. The phthalate plasticizers, when fed in large quantities to rats, can cause cancer. This does not prove that the storage of whole blood in plasticized PVC bags is a health risk. However, there has been a search for alternative polymers for blood bags.

Blood Bags can successfully replace the use of glass bottles for collection storage, transportation and transfusion of blood and blood components since bottles require exhaustive cleaning, rinsing and autoclaving procedures and there are chances of breakage at any stage. Further, use of disposable bags eliminates the possibility of any contamination.

In recent times, Blood Bags have become a conspicuous item and a dire need of hospitals and nursing homes to meet blood - infusion emergencies. Blood Bags are most ostensibly serving the medical field in crucial hour. As the number of hospital, nursing home & etc are increasing, the demand for the blood bags, too, is increasing tremendously.

Technologies advances achieved by medicare in the recent years have been historic. The Indian scenario has not remained immune to these changes. While IT (information technology) has come to the aid of the breakthroughs, the progress recorded in the medicare area is as impressive as it is in the IT sector itself. The changes are in both, form and content, as well as quantitative and qualitative. These have pervaded almost all specialties, from diagnostics to physiotherapy, from cardiology to oncology, from non-invasive surgery to transplants. In India, the emergence of private medicare services, especially through commercialization and corporatization, has contributed to the transformation.

Thanks to rapid commercialization of the medical practices with the establishment of multimillion hospitals, nursing homes & diagnostic centres (specialized and general) the demand has registered a very high growth rate in the recent years.

There is a good scope and market potential for new entrepreneurs to venture into this field.



***Cost Estimation:***

Capacity	:	30000 Nos./Day
		Each Bag of Capacity – 450 ML
Plant & Machinery	:	281 Lakhs
Total Capital Investment	:	2186 Lakhs
Rate of Return	:	45%
Break Even Point	:	36%

**Surgical Disposable Manufacturing Unit**

Surgical gowns are worn by doctors and nurses in the operating theatre to address a dual function of preventing transfer of microorganisms and body fluids from the operating staff to the patient, and also from patient to staff. Many of the performance requirements for surgical gowns are well documented.

Surgical gowns must repel diseases and infections yet provide adequate freedom to move. They must allow necessary mobility without rubbing and chafing, and must resist tearing and linting. They must fit closely but not restrict movement. Since there is generally excess fabric, the gowns must withstand constant pulls on the fabric during routine movements. A surgical drape is a covering made of a disposable non-woven material and is used to cover the area of a patient. A drape usually has a fenestration to allow the surgeon to perform the operation. It comes in various sizes depending on the type of operation for which it is used. Drapes also vary from hospital to hospital.

A surgical gown or drape is made to the user's specifications. Therefore, the amount of the subject fabric or other impervious or water repellent fabric used in a gown or drape varies for each tender, depending on the specification required.

The Healthcare Industry is the key driver for demand of surgical disposable fabrics due to increase in medical facilities & increase in number of healthcare units. The government of India has further released the Clinical Establishment Act to make sure that fair & quality health services are provided to all concerned. A rise in healthcare unit will automatically trigger the services of doctors, nurses & a good infrastructure facility which in turn good infrastructure will cater to the requirement of surgical disposable fabrics market. In India, the surgical disposable fabrics are one of the most promising sectors to be ventured in the near future. It will definitely show an impressive growth over the year to cater to a large population ensuring fair & quality health services to all incoming patients.

*Cost Estimation:*

Capacity	:	Surgeon Gowns 15000 Nos/Annum Patient Gowns 150000 Nos/Annum Bed Sheets 150000 Nos/Annum Drapes 600000 Nos/Annum Surgeon Caps 900000 Nos/Annum Sheets Different Type 150000 Nos/ Annum
Plant & Machinery	:	63 Lakhs
Cost of Project	:	239 Lakhs
Rate of Return	:	15%
Break Even Point	:	74%

*Information*

- ★ One Lac / Lakh / Lakhs is equivalent to one hundred thousand (100,000)
- ★ One Crore is equivalent to Ten Million (10,000,000)
- ★ T.C.I. is Total Capital Investment
- ★ All costs/amount given in INR ₹
- ★ NPCS can provide customized Detailed Project Report on all the projects
- ★ Visit us at: [www.niir.org](http://www.niir.org) Email: [info@niir.org](mailto:info@niir.org)

### Dairy Farming for Milk

In India dairying has been practiced as a rural cottage industry since the remote past, semi commercial dairying started with the establishment of military dairy farms and co operative milk unions throughout the country towards the end of the 19<sup>th</sup> century. The importance of milk in human diet especially for children and expectant and nursing matters is vital. To meet the demand of the increasing population milk production in India has to be increased. The development and maintenance of a superior dairy herd can be a sourced a considerable price and satisfaction. Success in dairy farming, like any professional achievement, does not come, easily. It requires the very best of anyone's ability to properly manage, feed, and breed a good herd of cows. The milk is used as a food. It is used to prepare curd, butter, ghee, cream and ice cream and it is used in hotels and restaurants as milk food preparation and in the preparation of tea. In 1998 India became the largest producer of milk in the world. It is also the largest consumer.

There is very good market potential of these products. The developing country like India is increasing its foreign exchange by exporting dairy as well as other processed food products.

#### *Cost Estimation:*

Capacity	:	720000 Ltrs./Annum
		Total Cows 150 Nos.
		Assume 100 cows will give Milk
		Through out the year Avg. 20 Ltrs.
		Milk/Day/Cows
Plant & Machinery	:	12 Lakhs
Total Capital Investment	:	160 Lakhs
Rate of Return	:	49%
Break Even Point	:	32%

### Dairy Milk Processing with Power Plant

Milk and milk products have been used by man since prehistoric times. Butter making was recorded as far back as 2000 B.C. It is through that cheese

making was discovered accidentally and initially developed in Iraq Circa 6000-7000 B.C. and spread with the migration of populations due to famines, conflicts and invasions. Examples of this are the development and the introduction of cheese making into England by the Romans. Fermented milks have been prepared for more than 2000 years. In this project report we have dealt with milk processing and making Butter, Ghee, Skimmed Milk Powder, Whole Milk Powder, Khoa, Curd, Paneer, Flavoured Milk, Full Cream, Tonned & skimmed milk in pouches etc. along with co-generation Power Plant.

In India milk is produced in most agricultural systems. It is either sold fresh or consumed as fermented milk and products. The demand of milk and milk products is increasing very fast all over world due to its nutritive value. So, there is a vast scope for the new entrants in this field.

***Cost Estimation:***

Capacity	:	Butter 7809 MT/Annum Ghee 9936 MT/Annum Skim Milk Powder 14875 MT/Annum Whole Milk Powder 7437 MT/annum Dairy Whitener 13015 MT/Annum Khoa 595 MT/Annum Panner 595 MT/Annum Curd 1487 MT/Annum Flavoured Milk 1 Ltrs Pack 7437000 Pack/Annum Full Cream Milk 500gm Pack 5950000 Pack/Annum Tonned Milk 500gm Pack 14875000 Pack/Annum Double Tonned Milk 500gm Pack 5950000 Pack/Annum Skimmed Mil 500gm Pack 14875000 Pack/Annum
Plant & Machinery	:	192 Cr.
Cost of Project	:	307 Cr.
Rate of Return	:	42%
Break Even Point	:	34%

### Zero QI Pitch for Graphite

The manufacture of standard commercial graphite as generally practiced in industry differs greatly from that of metals since graphite has no distinct melting point at reasonable pressures, and the usual methods of forming such as casting in industry is manufactured from carbon base material, rather than mined as the natural substance. For this reason it is frequently called artificial graphite. The graphite industry uses a process akin to that of the ceramic, but differing sharply in that a thermoplastic binder is used.

The first coal chemical recovery ovens were installed in the U.S. in 1863. By 1915, coke ovens accounted for 97% of the metallurgical coke produced in the U.S. The yield of coal tar, the feedstock for producing coal-tar pitch from a ton of coal is 30-45 litres. There is lot of demand for coal-tar pitch of present and the supply deficit is very high.

Coal tar pitch is used as binder in type the manufacture of various carbons such as graphite electrodes for the steel industry, carbon anodes for the aluminium industry. There are two types of QI that are formed during the cooking of coal: primary and carry over. The aluminium and graphite products industries in the country were at present the main consumers of coal tar pitch and related products.

#### *Cost Estimation:*

Capacity	:	High Grade Pitch 35400 MT/Annum
Plant & Machinery	:	875 Lakhs
Cost of Project	:	1447 Lakhs
Rate of Return	:	46%
Break Even Point	:	49%

### Fly Ash Bricks from Limestone

Fly Ash bricks are alternative to burnt clay bricks in the construction sector in India. Fly ash bricks are an environment friendly cost saving building product. These fly ash bricks are three times stronger than conventional bricks with consistent strength. This is proving to be a revolutionary invention that produces

bricks without the sintering process and consequently no greenhouse gases are emitted. The ultimate product is none other than FaL – G Brick which is well qualified as emission-abating project to receive the benefits of carbon credits.

India produces about 70 million tons of coal ash per year from burning about 200 million tons of coal per year for electric power generation. Coal-ash management poses a serious environmental problem for India and requires a mission-mode approach. Currently, about one acre per MW of land is needed for ash disposal. The Ministry of Power, Govt. of India estimates 1800 million tons of coal use every year and 600 million tons of fly ash generated by 2031-2032. The country consumes about 180 billion tonnes bricks, exhausting approximately 340 billion tonnes of clay every year and about 5000 acres of top soil land is made unfertile for a long period. The Government is seriously concerned over soil erosion for production of massive quantities of bricks, in the background of enormous housing needs.

Ministry of Environment & Forest (MoEF) Had issued a Gazette Notification on 14<sup>th</sup> Sep 1999, Stipulating that no person shall be permitted to manufacture clay bricks or tiles or blocks for use in construction activity without at least 25% of ash (fly ash, bottom ash, or pond ash on weight to weight basis), within a radius of 50 Km from coal or lignite based thermal power plants in India. Ministry of Environment & Forest had amended the Gazette Notification on 27 Aug 2003 making it compulsory to use fly ash for manufacturing building material by increasing the radius from 50 Km to 100 Km.

Fly ash bricks are nowadays mostly used for construction and gaining its popularity over builders and engineers because of its high strength, uniformity and less consumption of mortar plastering. Above to this it is eco friendly bricks which saves environmental damage caused by burnt clay bricks and saves top agricultural soil which was the main raw material in the burnt clay bricks.

Further ahead, by 2025-26 the number of middle class households in India is likely to more than double from the 2015-16 levels to 113.8 million households or 547 million individuals, indicative of increased household formation rate, and consequently increase demand for housing, thus providing a great market opportunity for new entrepreneurs according to NCAER. The demand is perceived to be higher for fly ash bricks & blocks than traditional bricks or blocks. The increased demand can be met by increased production levels of existing units or by setting up large scale manufacturing units. Fly ash utilization has great potential to lower green house gas emissions. Hence there is a bright market potential for fly ash bricks. New entrepreneurs should venture into this field.



***Cost Estimation:***

Capacity	:	12000000 Nos./Annum
Plant & Machinery	:	80 Lakhs
Total Capital Investment	:	409 Lakhs
Rate of Return	:	43%
Break Even Point	:	40%

**Bentonite Processing**

Bentonite is essentially highly plastic clay containing not less than 85% clay mineral, montmorillonite. Bentonite is of a great commercial importance possessing inherent bleaching properties like fullers earth, hence, it is known as bleaching clay. There are two types of bentonite viz swelling type or sodium bentonite and nonswelling type or calcium bentonite. Much of bentonites usefulness in the drilling and geotechnical engineering industry comes from its unique rheological properties. It can be used in cement, adhesives, ceramic bodies and cat litter. Bentonite has also number of uses in different industries. The strong growth in India has led to an exponential demand for foundry costing products for automotive industry. Also due to huge demand of iron ore pelletization, demand for bentonite in India would augment for years to come.

It is advisable for new entrepreneurs to venture into bentonite processing industry.

***Cost Estimation:***

Capacity	:	3000 MT/Annum
Plant & Machinery	:	259 Lakhs
Cost of Project	:	665 Lakhs
Rate of Return	:	43%
Break Even Point	:	60%

## Chapter 43

## MINING AND QUARRYING

### Iron Ore Mining

Iron with the symbol Fe, comes from latin ferrum. The use of iron has been known since the earliest times; it was prepared by the so-called bloomery hearth, or Catalan Forge. Iron ores were heated in a shallow trench with a large excess of wood charcoal, fanned by bellows. Lumps (blooms) of wrought iron were obtained, and were welded together by hammering. As technology advanced during the middle ages, the trench was replaced by small shaft furnace, and from this present day blast furnace has developed. Iron is the cheapest and most widely used metal. Its annual production exceed by far that of all other metals combined. It comprises approximately 93% of the tonnage of all the metals used. India is the only country in the world possessing huge recoverable reserve of iron ore to the tune of 13,400 million tons with average Fe content of 63%. Hence, the global steel industry is eyeing India in order to meet the iron ore requirements for steel production. New entrepreneurs venture in to this field will be successful.

#### *Cost Estimation:*

Plant Capacity	:	139 Lakh MT/Annum
Plant & Machinery	:	1030 Lakh
Cost of Project	:	1163 Lakh
Rate of Return	:	37%
Break Even Point	:	38%

### Coal Mining

Coal is an extremely heterogeneous, complex material that is difficult to characterize. Coal is a rock formed by geological process and is composed of a number of distinct organic entities (macerals) and lesser amounts of inorganic substances (minerals). Each of the coal macerals and minerals has a unique set of physical and chemical properties, there in turn control the overall behavior of coal. Although much is known about the properties of minerals in coal, for example, the crystal chemistry, crystallography, and magnetic and electrical properties, surprisingly little is known about the

properties of individual coal macerals. Even though coal is composed of macerals and minerals, it is not a uniform mixture of these substances. Users of coal - In the iron ore extraction plant, Domestic users as fuel sources, different industries using coal fired boiler. The demand of coal mining is increasing. So there exist a great scope for new entrepreneurs to enter in to this field.

***Cost Estimation:***

Plant Capacity	:	1350 Lakh MT/Annum (Job Work)
Plant & Machinery	:	751.77 Crores
Cost of Project	:	971.93 Crores
Rate of Return	:	41%
Break Even Point	:	42%

***Information***

- ★ One Lac / Lakh / Lakhs is equivalent to one hundred thousand (100,000)
- ★ One Crore is equivalent to Ten Million (10,000,000)
- ★ T.C.I. is Total Capital Investment
- ★ All costs/amount given in INR ₹
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### Safari Park

A safari park, sometimes known as a wildlife park is a zoo like commercial tourist attraction where visitors' car drive in their own vehicles or ride in vehicle provided by the facility to observe freely roaming animals. Safari is trip on land usually in jungle or savanna environment which is engaged in for the purpose of viewing or hunting animals. Most often, the modern safari involves viewing photographing and experiencing animals in their natural habitats with many animal species, fewer people undertake a safari to hunt animal.

India is a popular tourist destination in the world. It is frequently visited by global tourists. India is rich in flora and fauna. India is land that is dotted with golden desert charming beaches picturesque hill stations virginal back waters, wild life destinations, mountains, rivers, glaciers etc. All these things make India a great place to tour in India presents various options to enjoy the exhilarating adventure of safari tour. Jungle safari and desert safari are very popular option of safari tour in India. India is also famous providing the experience of horse safari, elephant safari and tiger safari. People from different part of globe visit India to experience the adventurous safari that makes more and more adventure in India.

#### *Cost Estimation:*

Capacity	: Visitors 6000 Nos./Day
Plant and Machinery	: 1099 Lakhs
Total Capital Investment	: 49486 Lakhs
Rate of Return	: 36%
Break Even Point	: 30%

### Extraction of Pectin from Citrus

Pectin is a naturally occurring substance present in all plant tissue, calcium pectin being present between the cell walls and serving as a strengthening or building agent. Fruits naturally possessing relatively large amount of pectin include lemons, bitter oranges, apples, quinces, groves, currants and plums. It is less plentiful in fruits such as black berries, raspberries, strawberries

and cherries. Pectin is a group of complex materials of very high molecular weight, which are able to form a gel in the presence of correct amounts of acidity and sugar. In the presence of fruit juices the gel will usually form when the concentration of sugar, acid and pectin are 58, 1 and 1 percent respectively. The pectin's in fruits juices are derived from proto pectin, an insoluble form of polygalacturomides whose structure is still to be elucidated. The normal processes of ripening cause the dehydration of insoluble proto pectin into pectin's (or pectinic acids) and associated polysaccharides, and many of the physical changes in the structure of fruit and vegetable tissues coinciding with ripening are due to these changes in the pectin constituents. The pectin eventually passes into a gelatinous condition slightly soluble in water.

It is suggested that pectin fundamentally comprises long-chain polygalacturomide molecules with only minor hydrogen bonding between chains. High jelly grade pectin's are those where minimum chain dehydration has taken place and about half of the galacturonic acid groups are condensed as methyl esters. Pectin acid is the completely demethylated product possessing no power of forming sugar acid gels as required in the preserving industry. Citrus pectin is usually sold in a finely powdered condition.

Pectin is available commercially in both liquid and powdered form. It has generally been extracted from either apples or citrus fruits. Pectin's are graded for the food industry. Grading is done according to sugar-carrying power.

The field of uses and applications of pectin show that there is vast consumption scope of pectin. It is very widely used in food and food processing industries. These are important ingredient and basic raw material for a large number of food products. For example, it is used in preparation of jam, jelly, sauces, pickles, ice cream, confectionery, drinks and a number of various food products. The market potential can be analyzed because of the growth prospects of its users industries. The food processing units have been mushrooming at a rapid pace. Apart from the indigenous consumption, there is a demand of pectin in export market. This industry may prove to be a good foreign exchange earner.

The supply is always lagging far behind its production. Its demand is increasing tremendously and the major requirement is being fulfilled through import.

There is a good scope to venture into this field for new entrepreneurs.

***Cost Estimation:***

Capacity	:	100500 Kg/Annum
Plant and Machinery	:	52 Lakhs
Total Capital Investment	:	232 Lakhs
Rate of Return	:	45%
Break Even Point	:	47%

### **Tennis Ball (Used in Playing Cricket)**

The game of Tennis is one of the most popular sports throughout the world. Tennis is also being popular in our country. India has produced some of the very famous player like Ram Nath Krishan, Vijay Amritraj etc. in contemporary tennis, which shows the extent of popularity in our country. Tennis ball cricket is a variant of cricket popular in the Indian subcontinent and every South Asians living in the US and Canada. In this game, a more difficult version of tennis ball is used. The ball is not as hard as cricket ball. The tennis ball in cricket games are shorter versions to first-class cricket matches; they are especially suited to recreational weekend play. The tennis ball used in playing cricket is of high quality. It is used both for any indoor and outdoor play. The felt covered ball has a solid core. It is much to same in size to the tennis ball. This ball does not loose shape, keeps its firmness. It does not puncture, or deflate due to loss in pressure. This ball comes in many colours. They are red, yellow, green, white and orange. The weight range from 60 gms to 120 gms.

Tennis ball is used to play the Tennis. Sometimes Tennis ball is used for playing cricket. Children play it more otherwise also i.e. in their homes they play catch to catch which help them in practicing of some other games. It also help them learning art of catching the ball.

The process of manufacture for Tennis Balls is quite simple and does not need even much investment including fixed and working capital. No foreign exchange is involved in the plant for manufacturing of tennis balls.

India exports to some 50 countries including developed countries like U.S.A, U.K. to small countries like Fiji, Nepal etc. The share of U.K., U.S.A. and Australia together is found around 40% in total export of sports goods from India. There is good domestic as well as export demand of Tennis ball.

#### ***Cost Estimation:***

Capacity	:	1200 Nos./Day
Plant & Machinery	:	10 Lakhs
Total Capital Investment	:	86 Lakhs
Rate of Return	:	43%
Break Even Point	:	44%

### **Water Softener**

Water is an abundantly available as a precious gift of nature. However, natural water many times contains dissolved impurities such as Carbonates of Calcium and Magnesium. This is commonly termed as Hardness in water chemistry. This hardness ions causes scaling and corrosion in equipments like boilers & cooling towers. Water softening system is based on IONEXCHANGE PROCESS. Uses – Boiler Feed, Cooling water makeup, Process Equipment,



Hospitals & Laboratories, Textile & Process House, Ice Factories, Humidification Plants, Food & Beverages, Breweries & Dairies, Hotel & Restaurant etc. Most of the industries use the water softening unit to soften the water before using it in the Boiler, cooling towers different chemical manufacturing unit. It is totally associated with the industrial development of the country. There is average growth of industries 5.5% on that base demand growth a also increase of the softening plant is 5% and above. There is good scope of new industry in this field.

***Cost Estimations:***

Plant Capacity	:	1500Nos./Annum
Plant & M/c	:	10 Lacs
W.C. for 3 Months	:	364 Lacs
Rate of Return	:	74%
Break Even Point	:	20%

**NPK Complex Fertilizer Plant**

Fertilizer is a material that is added to the soil to supply one or more elements required for plant growth and productiveness. The major three elements are nitrogen, potassium and phosphorus, the secondary elements are calcium, sulfur, magnesium, and other elements are boron, manganese, iron, zinc, copper and molybdenum. Fertilizers enhance the natural fertility of the soil or replace the chemical elements taken from the soil by harvesting, grazing, leaching or erosion. Organic fertilizers include properly managed barnyard manure, compost and green manure. Manure contains nitrogen and phosphate content. It is sometimes modified with super phosphate to make it a better balanced fertilizer. Compost, decayed to a relatively stable, amorphous state, is made from plant materials mixed with manure and some soil. Green manure is a herbaceous plant material plowed into the soil that has not undergone decay.

Artificial fertilizers are inorganic fertilizers formulated in appropriate concentrations and combinations supply three main nutrients: nitrogen, phosphorus and potassium (N, P and K) for various crops and growing conditions. N(nitrogen) promotes leaf growth and forms proteins and chlorophyll. P (phosphorus) contributes to root, flower and fruit development. K (potassium) contributes to stem and root growth and the synthesis of proteins. The common inorganic fertilizers include ammonia (82% nitrogen), NPK combinations, urea (46% nitrogen), super phosphate, mono and dibasic ammonium phosphates (containing nitrogen and phosphate), calcium ammonium nitrate, potassium chloride (muriate of potash).

There are many grades and analyses of nitrogen (N), phosphorus (P) and potassium (K) fertilizers, but all can be grouped into three classes—liquids, solids and gaseous.

There is nothing mysterious about different grades or types of fertilizers. For a particular grade, many fertilizers have the same chemical compounds and are used for the same basic purposes—to supplement the essential plant nutrients in the soil.

The Indian Fertilizer Industry is one of the allied sectors of the agricultural sphere. India has emerged as the third largest producer of nitrogenous fertilizers. The adoption of back to back Five Year plans has paved the way for self sufficiency in the production of food grains. In fact production has gone up to an extent that there is scope for the export of food grains. This surplus has been facilitated by the use of chemical fertilizers.

NPK mixture fertilizers are formulated & recommended by agricultural scientists to enhance the output of the crops by giving it specific and exclusive blend of plant nutrients. All the major plant nutrients like Nitrogen, Phosphorus and Potash are mixed in different ratios to make it suitable for specific crops. These specific ratios of N P & K are called grades. The numbers in the grade's name represents the percentage of N,  $P_2O_5$  &  $K_2O$  respectively in the mixture. There are separate grades for Rice, Wheat, Potato and Sugarcane etc.

Thus Fertilizer is a key ingredient in ensuring the food security of the country, as it increases the production and productivity of the soil. This target can be achieved by higher productivity through improved farming practices, expansion of irrigation, better seeds and extensive and balanced use of fertilizers. Towards this end, the government of India is now planning to raise the production of urea by the end of 11<sup>th</sup> Five Year Plan by taking concrete steps to boost production and productivity. All these things show the definite growth of fertilizer industry in India.

There is a very good scope and new entrepreneurs should venture into this field.

***Cost Estimation:***

Capacity	:	450000 MT/Annum
Plant & Machinery	:	1500 Lakhs
Cost of Project	:	3576 Lakhs
Rate of Return	:	45%
Break Even Point	:	49%

**Hydrogen Gas from Methanol Cracking**

Hydrogen gas was first artificially produced in the early 16<sup>th</sup> century, via the mixing of metals with strong acids. In 1766-81, Henry Cavendish was the first to recognize that hydrogen gas was discrete substance, and that it produces water when burned, a property which later gave it its name, which in Greek means water former. At standard temperature and pressure, hydrogen is a

colourless, odourless, non-metallic, tasteless, non-toxic, highly combustible diatomic gas with the molecular formula  $H_2$ . Hydrogen is a concern in metallurgy as it can embrittle many metals, complicating the design of pipelines and storage tank. Hydrogen is found in the atmosphere at trace levels. It is synthesized from hydrocarbon and from water where it constitutes the lightest.

Fraction of the  $H_2O$  molecular Hydrogen gas cannot sustain life. Hydrogen is widely used for the hydrogenation of vegetables and animal oil and fats. Hydrogen also finds uses in the metallurgy field because of its ability to reduce metal oxides and prevent oxidation of metals in heat treating certain metals and alloys. Hydrogen is extensively used in the synthesis of ammonia and in petroleum refining operations. Liquefied hydrogen has been used primarily as a Rockets and Space Vehicle. The hydrogen atom has a nucleus consisting of a proton bearing one unit of positive electrical charge, an electron, bearing one unit of negative electrical charge, is associated with the nucleus.

There is a good market potential in such products and new entrepreneurs can venture in to this project.

***Cost Estimation:***

Capacity	:	120000 Nos. Cylinder/Annum 6m3 80000 Nos. Cylinder/Annum 9m3
Plant & Machinery	:	707 Lakhs
Cost of Project	:	1202 Lakhs
Rate of Return	:	45%
Break Even Point	:	44%

**Flexographic Inks**

Flexographic inks are used in printing packaging materials, including cartons, corrugated containers, paper and plastic bags, food containers, newspapers, catalogues and more. Flexography printing method continues to grow in popularity because of its simplicity and environmental friendliness. The most important part of the process is the application of the ink.

Flexographic inks consist of colorants, which may be pigments and soluble dyes along with a binder and various solvents. Both Solvent based and water based inks commonly contain various types alcohol as the primary solvent or drier. Alcohol rapidly dries through evaporation and contributes to VOC emissions. The inks may also contain glycol ether and/or ammonia which facilitate drying.

As each year passes, more water ink technology has come to fruition to meet the challenges. Each passing month brings more technology to ink makers, further enabling them to meet the demands of their customers. Changes in substrate coatings and new resins and slip additives for films have also contributed to producing substrates that are more receptive to

water inks. These include replacements for very popular products now specified that are not very receptive to the water technology. Water-based inks are now a viable option for flexographic printers. Water based inks provide an alternative to these solvents and a means of eliminating both pollution and many of the regulatory constraints on the printer. The most important element in a decision to switch to water-based inks is a commitment from management. If management sincerely wants water to work, it will make the necessary changes and provide adequate training of personnel to make it happen. Flexo inks are used primarily in furniture laminates, construction materials and carton box packaging.

India is the fastest growing print industry after China and Japan. These are exciting times for the imaging and printing industry. India has been witnessing healthy growth in the printer market with the technology getting better year after year.

Currently, the printing ink market in India is worth Rs.15 billion and is growing at the rate of 15-18 percent yearly. There are around 25 – 35 ink makers in the medium size category and an estimated 200 ink makers in the small scale segment. In terms of tonnage of ink manufactured in India, it is estimated to be 110 million tonnes. The ink demand in the Newspaper Industry grew rapidly over the past 3 – 4 years by nearly 20%. In spite of the global meltdown, the newspaper industry has grown nearly 25% in readership. The Packaging Industry which is another main consumer of printing ink, has witnessed a growth of approximately 12.5% and the corrugated packing industry grew by over 8%.The flexible packaging growth is in excess of 15% with the expansion of the food and retail industry. Another area of high growth driver is expected in the Can Coating segment which is presently at 3 – 4% growth but is expected to show an increase when more food products like meats and seafood are increasingly packaged and the beverage industry expands with increase in consumption of Sodas, Soft Drinks, Tea, Coffee and Beer. Other segment of Ink consumption in screen printing is also showing steady growth trends. The Electronic Industry has special demands for inks for PCBs, Membranes and Touch Panels, etc. The Inkjet ink requirement in the country is expanding rapidly. Though the majority of inks for this industry are presently imported, there is a large scope for new players. There is a great opportunity and demand for Indian inks makers as well as International Brands in Indian markets.

The global digital imaging market is projected to grow to \$31 billion by 2009 with the Middle East and Asian markets claiming a 33 percent share against the current 10 percent. According to a report by Pira International, the digital print market is set to be worth EURO 124.8 billion by 2015. This huge growth potential in print industry will definitely drive the printing ink industry. Evolving technologies, shifting client needs and expanding global markets are adding to the challenge of in the print Industry. India's competitive advantages

are mainly in terms of low-costs base, logistics and other costs. All these factors show that there is a very good scope and good market potential in this sector. New entrepreneurs should venture in this field.

***Cost Estimation:***

Capacity	: 150000 Kg./Annum
Plant and Machinery	: 36 Lakhs
Total Capital Investment	: 139 Lakhs
Rate of Return	: 47%
Break Even Point	: 41%

**Batching Plant for Asphalt**

Asphalt is a humid, black and extremely thick liquid or semi-solid that exists in most crude petroleum and also in a few natural deposits. Asphalt concrete is an important composite substance that is used for the construction of roads. Asphalt is utilized as a binder or glue for the aggregate elements. Asphalt consists of a mix of various sizes of rock, oil, and some other additives like lime. Changing the proportion of the elements causes different design mix. A design mixture for each specific work is selected in accordance with the soil conditions, moisture content, and temperature.

The types of asphalt mixing plant normally used are the batch heater and the drum mix. The asphalt mixing plant is a machine used for an efficient mixing of road construction materials. Numerous composite materials, fillers, sand, and binders are combined in a suitable proportion, so that the aggregate material is transformed into a solid material. The raw materials are brought from hoppers to the drum at an accurately designed speed, where these materials are heated. The aggregates are coated by the binder spray. The change in mixture is varied by adjusting the feed rate of the aggregates, binder, and stone dust. The viscosity and temperature of the binder are carefully controlled to ensure production of the asphalt according to the desired specifications. Batch Asphalt Plants literally make Hot Mix Asphalt (HMA) one batch at a time. They have the advantage of being able to tailor each truckload of HMA to exact specifications, whereas a drum asphalt plant generally produces high volumes of the same "recipe". Aggregate, RAP and asphalt cement are mixed in a pug mill mixer rather than a drum.

***Cost Estimation:***

Capacity	: 384000 MT/Annum Asphalt Mix
Plant & Machinery	: 121 Lakhs
Total Capital Investment	: 4565 Lakhs
Rate of Return	: 51%
Break Even Point	: 26%

### Exercise Note Book and Register

Exercise books are widely used by teachers, students, housewives, businessmen and office going people. Note books of various shapes, sizes and pages with different type of covers like paper bound, board, rexine bound etc are available in the market. With the growth of education among the masses and industrialization within the country, the demand of stationary notebook has been increasing at a tremendous rate. Many cottage and small scale industries in India are manufacturing these items. Keeping in view the recent shortage of paper, the government has taken steps to provide paper at a subsidised rate to exercise book manufacturers.

#### *Cost Estimation:*

Plant Capacity	: 5,00,000 Nos. / Day
Plant & Machinery	: Rs. 4.53 Lakhs
W.C. for 3 Months	: Rs. 16.42 Lakhs
Total Capital Investment	: Rs. 21.75 Lakhs
Rate of Return	: 58.72%
Break Even Point	: 47.76%

### Power Laundry

There is cleaning requirement everywhere. Cleanliness is the sources of beauty and also the placement of God. If we wear dirty clothes no one wants to talk with us, in such cases laundry unit is one of the unit by which dirty clothes are cleaned by operations because if our clothes are clean everyone wants to talk with us.

Majority of people wants to clean their clothes through machines only. In dry cleaning operations there is no need of water because it they contains washing, cleaning, drying and pressing unit in a compact manner but in ordinary cleaning there is a need of lot of water, detergent and soap. Mechanization of laundry unit indicates the modern growth of scientific life. We used laundry for many reasons like it is used or rapid systematic cleaning of daily use clothes as well as valuable clothes for rare use or occasional uses and it's used for rapid washing and cleaning of the urgent required clothes. Laundry unit is time bound working system. There is very small space required, There should be solvent level in the actual indicator position. It may work by steam or by electrically heating system. It is physical system to carry out the process.

Laundry unit may come under the tiny scale industry to small-scale unit. Now a day there is a very good export scope of garments. In garment industry there is requirement of laundry unit. As there is advanced of modernity and is need of every human being to use cleaned ironed dress in the society. The present day sophisticated standard of living recognizes the importance



of cleanliness and smart dressings. It is due to this reason that the modern human being has accepted dry cleaning as a must for a smart look. Washing machines are available with capacities from 1 kg to 10 kgs. of clothes which can work on automatic lines but for the industry to expand, they have to move to new technologies. Laundry, today, is very much an industry even within the govt. policies. As a whole laundry unit now a day heart of the city life, it is associated with the growth of life. So there is good scope for these types of establishments in India.

***Cost Estimation:***

Capacity	: 1000 Pcs/Day
Plant & Machinery	: 33 Lakhs
Total Capital Investment	: 134 Lakhs
Rate of Return	: 47%
Break Even Point	: 44%

**Coal Tar Pitch Distillation**

Coal tar is a brown or black liquid of high viscosity, which smells of naphthalene and aromatic hydro carbons. Coal tar is among the by-products when coal is carbonized to make coke or gasified to make coal gas. Coal tars are complex and variable mixtures of phenols, polycyclic aromatic hydro carbons, and metro cyclic compounds, about 200 substances in all. Coal tar is a thick black liquid the consistency of a thick pudding. Coal tars are by metallurgical coke or natural gas. In building projects, this coal by products can be used for roofing jobs, coal tar provides a nice sealant underneath shingles. Coal tar also works as an insulating agent, working with the wall insulation to help maintain a comfortable temperature inside the building, regardless of the outside weather. There are also a number of exterior paints that utilize coal tar in their finished product. The substances provide an excellent sealed surface one it dries in place. Coal tar also helps to keep your space warm. Coal tar is used some boilers to create heat that can then be directed to the duct system that runs throughout the home. Coal tar is also used to manufacture paints, synthetic dyes and photographic material. Like pine tar, it can be used in medicated shampoo, soap and ointment, as a treatment for dandruff, as well as being used to kill and repel head lice. The first coal chemical recovery ovens were installed in U.S. in 1893.

There is a lot of demand for coal tar at present and the supply deficit is very high.

***Cost Estimation:***

Capacity	: 500 MT/Annum (Light Oil) 2340 MT/Annum (Carbolic Oil) 9450 MT/Annum (Naphthalene Oil) 8370 MT/Annum (Wash Oil)
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		12600 MT/Annum (Anthracene Oil)
		9000 MT/Annum (Heavy Oil)
		42300 MT/Annum (Coal Tar Pitch)
Plant & Machinery	:	1531 Lakhs
Cost of Project	:	3068 Lakhs
Rate of Return	:	46%
Break Even Point	:	38%

### Lube Oil Blending Based on Imported Base Oil

Lube oil is a substance (often a liquid) introduced between two moving surfaces to reduce the friction between them, improving efficiency and reducing wear. They may also have the function of dissolving or transporting foreign particles and of distributing heat.

Lubricants today are classified into two major groups: Automotive lubricants and Industrial lubricants. One of the single largest applications for lubricants, in the form of motor oil is to protect the internal combustion engines in motor vehicles and powered equipment. Practically lube oil contain 90% base oil (most often petroleum fractions, called mineral oils) and less than 10% additives. Vegetable oils or synthetic liquids such as hydrogenated polyolefin, esters, silicones, fluorocarbons and many others are sometimes used as base oils. Additives deliver reduced friction and wear, increased viscosity, improved viscosity index, resistance to corrosion and oxidation, aging or contamination, etc.

The basic functions of a lubricant are friction and wear reduction, heat removal and contaminant suspension. Apart from important application in internal combustion engines, vehicles and industrial gear boxes, compressors, turbines or hydraulic systems, there are vast numbers of other applications, which mostly require specifically tailored lubricants. Designing a lubricant to perform above stated functions in different systems is a complex task, involving a careful balance of properties both in the lube base stocks and the performance enhancing additives. Between 5000 and 10000 different lubricant formulations are necessary to satisfy more than 90% of all lubricant applications.

India is the sixth largest consumer of lubricants in the world. Each one of the vast contingent of 22 Multinationals and a total of 80 big & small players are vying for a pie of Rs. 5, 500 Crore market. Worldwide established brands, some of them albeit new to India, like Shell, Mobil, Caltex, Elf, Pennzoil are fighting it out with established Indian brands like SERVO & others to establish their foothold in the 6th largest lubricant market in the World. Compared to the average World consumption of 35 Million tonnes per annum & Asia-Pacific region consumption of 7.5 million tonnes, the Indian lube industry with annual demand of 1 million tonnes is just behind Japan and China in Asia having a demand growth rate of 4% compared to the World growth rate ranging between zero to 2%. That is the lube industry in India today.

The current lubricants market is estimated to be of Rs. 60 billion. The automotive lubricants market in India was controlled by the four major public sector oil companies such as major public sector oil companies such as Indian Oil Corporation Limited (IOCL), Hindustan Petroleum Corporation Limited (HPCL), Bharat Petroleum Corporation Limited (BPCL) and a handful of private companies such as Castrol, Tidewater, and others until 1992. Following liberalization, major policy initiatives were taken and which encouraged foreign companies to invest in India.

Companies are adopting a more customer-oriented approach where they are likely to focus on creating brand awareness through print and visual media. For example promotional campaigns and trade shows offering gifts to their customers are methods of driving sales of automotive lubricants. The original equipment segment and retail trade are the two major marketing channels in the Indian automotive lubricants market. Due to the growing competition, tie-ups with original equipment manufacturers (OEM) are becoming important as they reinforce the value proposition of a particular brand.

There is a very good scope for new entrepreneurs in this field.

***Cost Estimation:***

Capacity	: 15000 Kls./Annum
Plant & Machinery	: 142 Lakhs
Cost of Project	: 804 Lakhs
Rate of Return	: 43%
Break Even Point	: 51%

**Hot-Dip Galvanizing Plant**

Hot-dip galvanizing is a process in which an adherent, protective coating of zinc compounds is developed on the surface of iron and steel products by immersing them in a bath of molten zinc. The protective coating usually consists of several layers. Those closest to the basic metal are composed of iron-zinc compounds; these in turn are covered by an outer layer consisting almost entirely of zinc. The complex structure of layers that comprise a galvanized coating varies greatly in chemical properties, being affected by chemical activity, diffusion and subsequent cooling.

Hot-dip galvanized coatings are produced on a variety of steel mill products, using fully mechanized, mass production methods. This article, however, is concerned primarily with the hot dip galvanizing of fabricated articles in manual or semiautomatic batch operations. From a modest beginning, about a century ago, the engineering industry in India has come along way and today the industry produces a stupefying range of products like plant and machinery, machine tools, power generating transmission and distribution equipments, commercial vehicles and a variety of other industrial goods and consumer durables. The significance of the engineering industry in India's industrial set up stems from its forward and backward linkages with virtually

all sectors. There is bright scope for new investment. Any entrepreneur can enter in this field.

***Cost Estimation:***

Plant Capacity	: 12 MT/Day
Plant & M/c	: US \$ 3.51 Lakh
T.C.I.	: US \$17.18 Lakh
Rate of Return	: 53%
Break Even Point	: 48%

**Hot-Dip Galvanizing**

Hot-dip galvanizing is usually a process of coating a steel surface with a layer of pure zinc or zinc coating along with a few alloying elements like tin, aluminum etc in molten condition by immersing the steel component in a bath of molten zinc. The coating of zinc so developed provides a cathodic protection to underneath steel surface. Hot dip galvanizing occupies the place of highest application since galvanized steel surfaces offer better surface protection at lower cost particularly in humid atmosphere. The demand for different types of galvanized items is increasing year after year keeping the above in view the unit provides good scope for new entrepreneur in the field.

***Cost Estimation:***

Plant Capacity	: 80.0 MT/Day
Plant & Machinery	: Rs. 174.0 Lakhs
Working Capacity for 3 Months:	Rs. 406.0 Lakhs
Total Capital Investment	: Rs. 631.3 Lakhs
Rate of Return	: 42.82%
Break Even Point	: 42.19%

**Ceramic Foam Filters**

Ceramic foam filters are commonly used for filtering a variety of molten metals, including aluminium, copper & iron. As a whole there will be good market demand of ceramic filter. It can be assumed that there are few broad gaps of the product manufacturers and market demand. Since the market demand can be filled up by new coming manufacturers. Average market growth of European country is about 10% considering their products to import in the Asian countries.

***Cost Estimation:***

Plant Capacity	: 100000 Pcs/Annum
Plant & Machinery	: Rs. 50 Lakhs
W.C. for 3 months	: Rs. 150 Lakhs
Total Capital Investment	: Rs. 450 Lakhs
Rate of Return	: 10.87%
Break Even Point	: 42.36%

### **Welding Electrodes**

The heavily coated electrode, employed for most structural steel welding is a core wire of low carbon rimmed steel, which is covered by extrusion with a sheath of material of consistency. The sheath dries to a hard semi flexible tube, which becomes firmly attached to the core wire. The compounding of coating was at one time a closely guarded secret of the manufacturer concerned but the technical advance in our knowledge have led to an understanding by the welding engineer of the function of each addition made to the coating.

Welding electrodes are extensively used in all type of mechanical process as joints two pieces in one, to give cylindrical shape to a flat sheet filling a small hole on the surface of the sheet.

The welding electrodes are manufactured in standard range of diameters corresponding standard lengths. 3.15 mm Ø & 4 mm Ø electrode are manufactured in 350 mm & 450 mm lengths respectively. These are the coat-finished diameters.

The plant is highly suitable for SSI sector. The electrode consumption is directly proportional to the overall steel consumption looking at the steel production targets in future, it can be well felt that welding electrode industry has a very good scope in India.

Welding industry is substantially dependent on the automobile, steel and engineering sectors. The market for welding segment is divided into welding equipment and consumables in the ratio of 1:3. The welding equipment market is divided between manual metal arc welding and automatic and semi-automatic welding equipment. The relationship between the manual and others is 3:1. Slightly more than half of the market is in the organized sector; the informal sector and imports account for the balance.

The welding machinery and electrodes market is basically served by two leading players, Advani-Oerlikon and Esab with sizable contributions from Ewac Alloys and Modi Industries. Indal and Ahura are other major players. New entrants in the industry are the MNCs: D&H Welding, Leicon Electric (USA), and Hyundai Corp of South Korea.

#### ***Cost Estimation:***

Capacity	:	1200 MT/Annum (Welding Rods)
Plant & Machinery	:	21 Lakhs
Total Capital Investment	:	165 Lakhs (W/C – 2 Month)
Rate of Return	:	49%
Break Even Point	:	40%

### **Instant Tea (Without Premix of Milk & Sugar)**

Instant tea is a form of tea that is derived from brewed tea. Its dried granulated form can be made into a beverage with the addition of cold or hot water. Instant tea is typically lower in antioxidants than traditional tea and comes in a variety of flavours. Instant tea may be formulated for use in making either hot or iced tea. It quickly dissolves in water. Some instant teas contain sweeteners. Tea is the second most consumed beverage in the world, playing second fiddle only to water. It is in almost every culture, and there are literally thousands of varieties. Instant tea comes in many flavours. Popular instant tea flavours include lemon, cinnamon, fruit juice and other flavourings. Green, black, white and herbal teas are all available in instant form. There are four main types of tea which are, white, green, oolong, and black, all which are born from the same species of plant.

### **Benefits**

- ★ Promotes a healthier immune system and can help ward off infection.
- ★ Is good for the heart by lowering blood pressure and cholesterol.
- ★ Can increase thermo genesis which may help aid in natural weight loss.
- ★ Promotes younger looking skin by destroying free radicals.
- ★ Shows evidence of preventing and destroying certain tumours and cancer cells.
- ★ Can even help reduce the build up of bacteria causing plague and lead to a brighter smile.

### **Global Demand**

The term "instant tea" is key to the successful marketing of the product. India produces almost 30% of the world's tea it exports less than 20% of the world's supply. To stimulate the industry, the government allowed a higher



investment allowance (40%) for the tea industry enabling tea companies to invest in rejuvenation and replanting of tea bushes and undertaking developmental programs under schemes approved by the Tea Board of India. The traditional leading per capita tea consuming regions, like Asia, remain less likely to drink instant, so the product is oriented to export globalization. The U.S. alone receives approximately 70% of India's exported instant, with the remaining 30% going to 22 other nations. Darjeeling and Assam account for 75% of tea output, leaving about 25% to southern states. India consumes about 80% of the total output. Auctions account for some 60% of tea sales and despite problems, it is envisaged that this share will be maintained.

Therefore the scope for this product is very bright. An entrepreneur venturing into this project will find it very lucrative.

***Cost Estimation:***

Capacity	: 100 Kg/day
Plant and Machinery	: 42 Lakhs
Total capital investment	: 172 Lakhs
Rate of return	: 46%
Break Even Point	: 43%

**Soft Drink (Aerated Water)**

Aerated drinks are become part and parcel of the Indian lifestyle. Taste is the main factor which drives the demand of the product. Urban areas report a dramatically high consumption of aerated drinks as compared to rural areas. Be it children, the college kid or the middle aged Indian soft drinks are enjoyed by one and all in the country. Especially after the influx of a number of fast food joints in India soft drinks have gained more popularity. Food like pizzas burgers and French fries go hand in hand with soft drinks. Aerated Beverages is an important sector in the country because it not only contributes to export earnings of the country, but is a revenue driver for other industries such as glass, refrigeration, transport, paper and sugar. Despite several issues that crept up regarding the ingredients used behind the manufacturing of soft drinks the market remained stable.

Aerated drinks are enormously popular beverages consisting primarily of carbonated water, sugar, and flavourings. Soft and aerated drinks were considered products for the middle class and the affluent. That segregation is no more valid. Soft and aerated drinks are consumed by all except those who cannot afford to buy any drink. An NCAER study says that 91% soft drink sales are made to the lower, middle and upper middle classes. The soft drink industry has been urging the government to categorize aerated waters (soft drinks) equitably with other consumer products of mass consumption and remove special excise duty.

As flavoured carbonated beverages gained popularity, manufacturers struggled to find an appropriate name for the drinks. Some suggested "marble water," "syrup water," and "aerated water." The most appealing name, however, was "soft drink". The process of dissolving carbon dioxide gas is called carbonation. It results in the formation of carbonic acid (which has the chemical formula  $H_2CO_3$ ). Soda water is generally of two kinds, viz. Plain Soda Water (Aerated Soda Water) and Flavoured Soda Water (Aerated Beverages). In Plain Soda Water, Carbonic Acid Gas ( $CO_2$ ) & Sodium-bis-carbonate solution under pressure is mixed with pure water. Flavoured Soda Water contains flavours of lemon, ginger (Masala Soda), milk rose, mango, pineapple, etc. in syrup base and this preparation is also made using carbonic acid gas ( $CO_2$ ) under pressure.

Soft drinks constitute the third largest packaged food segment in India after packaged tea and packaged biscuits. But the penetration level of carbonated soft drinks in India is still low compared with other developing markets, an indication for further potential for rapid growth. The 60-bn-rupee soft drink industry is growing now at around 5% annually. In India, Coke and Pepsi have a combined market share of around 95% directly or through franchisees. Campa Cola has a 1% share, and the rest is divided among local players.

The per capita consumption of soft drinks in India is around 5 to 6 bottles (same as Nepal's) compared to Pakistan's 17 bottles, Sri Lanka's 21, Thailand's 73, the Philippines 173 and Mexico 605. According to [indiastat.com](http://indiastat.com), the 72-billion rupee soft drink industry is growing at 6 to 7% annually. In India, Coke and Pepsi have a combined market share of around 95% directly or through franchisees. The demand for aerated drinks is currently 373 million and is expected to be around 479 million by the year 2014-15. The market growth rate is expected to be 3.5% from 2009-10 to 2014-15.

There is a very good market potential and good scope in this sector. New entrepreneurs should venture into this field.

***Cost Estimation:***

Capacity	: 7200000 Ltrs./Annum
Plant & Machinery	: 271 Lakhs
Cost of Project	: 494 Lakhs
Rate of Return	: 43%
Break Even Point	: 53%

**Instant Coffee**

Instant Coffee is used extensively as beverages and is employed also as a flavouring material. Brooke Bond India Ltd. and Food specialities Ltd. are the key manufacturer of Instant Coffee.

***Cost Estimation:***

Plant Capacity	:	3.50 MT/Day
Plant and Machinery	:	Rs. 193.00 Lacs
Cost of Project	:	Rs. 347.00 Lacs
Rate of Return	:	69%

**Flavoured Drinking Water**

Bottled water industry, colloquially called, the mineral water industry, is a symbol of a new lifestyle and health-consciousness emerging in India. While a large segment of the population is struggling to get access to potable water supply, a new generation - especially in the urban areas is getting accustomed to bottled water paying handsome prices.

Flavoured water is the new phenomenon that is likely to take the Indian beverage industry by storm. The introduction of flavoured water into the bottled industry is to diversify business and at the same time to satisfy the growing consumer needs by introducing value addition to the Drinking water. It is expected to serve as a refreshing alternative to sodas, colas, juices and other sweetened beverages. The concept is not new. There are historical evidences that Indian Maharajas drank water with Indian Herbs to stay healthy and fit. Water processing units now are busy exploring ways to add as much Indian herbs as possible into our daily dose of drinking water not only to diversify their business but also to add value to their struggling bottled water industry.

Potentially Flavoured water can promote a healthy lifestyle as the flavours make people consume more water, which will make them healthy. Our country has a rich herbal treasure that means consumers get a variety of flavours to choose from. Demand-supply scenario suggests that the flavoured water industry has great potential for investment.

The bottled water industry in India has been growing steadily and is dominated by certain brands in the market. The packaged water segment is extremely competitive with players ramping up their packaging styles to attract a large base of consumers in order to account for a larger share in the market. With rising consumer concerns over health and increasing shelf spaces in the institutional channels, flavoured water comes as a blessing in disguise. It is the much needed diversification that water processing units are eagerly waiting for. It is the ready-to-grab option that they can explore and prosper. Though flavoured water was introduced in 2004, it is not widely available now. There has not been a coordinated effort from processing units, distributors and other retailers. We can say that flavoured water is still going through the initial resistance as every new innovation had to undergo before being accepted. During the initial research, expectedly, flavoured water has received

tremendous response among the Indian consumers. It is a welcome addition to quench the thirst of every Indian consumer.

By nature, humans prefer sweet-tasting liquid. So, we are naturally inclined to drink something that tastes better than the tasteless water. By gut feel we can ascertain that flavoured water has a huge market as far as India is concerned. When packaged well and offered at right price, this is sure to explode. Despite the steep increase in consumption and demand, purified water industry is not growing as quickly as it potentially can. Water processing units had to manage mounting operational cost, unprecedented competition from unauthorized players, stiff competition from purification gadgets and pressing regulatory constraints. Flavoured water comes as a blessing in disguise. It is the much needed diversification that water processing units are eagerly waiting for. It is the ready-to-grab option that they can explore and prosper. Many units have understood that it makes complete business & economic sense to produce flavoured water as they have a very narrow scope for growth & prosperity in their existing packaged drinking water business. A fact supported by growing number of water processing units venturing into producing flavoured water in India. The rapidly growing market for packaged drinking water comprises 90% and natural mineral water 10% of the total market just leaving enough space for launching new flavours of drinking water for new entrants.

Some commercial companies' flavoured waters are :

1. Index flavoured water is a refreshing drink with a hint of flavour. There is no sugar or artificial sweeteners. There are also children Hint - drink a kid.
2. Metromint-product of the delicious water called Mint water.
3. Waters is the beverage company "Y beverages" and makes flavoured water.
4. Flavour Splash Aquafina is water-filtered with natural fruit flavours and sucralose. It has zero calories, no sugar and no carbohydrates.
4. Dasani flavoured water two varieties - Dasani Lemon and Dasani Raspberry which are sweetened with Splenda and has no calories and carbohydrates.
5. Catch brand flavoured water from DS groups.

The flavoured water market is still at a nascent stage in India. Many units have understood that it makes complete business & economic sense to produce flavoured water as they have a very narrow scope for growth & prosperity in their existing packaged drinking water business. A fact supported by growing number of water processing units venturing into producing flavoured water in India.

There is a very good scope for this product and it is the right time for new entrepreneurs to venture into this field.

### **Canned Carrot Juice & Bottle Gourd/Long Melon (Lauki Ka Juice) in Tetra Pack**

The juice of fresh vegetables is the richest available food sources of vitamins, minerals & enzymes. Usually we just can't eat enough raw vegetables in a day to nourish our body properly. It is especially true today; we need extra nutrients to help our body detoxify a large amount of environmental toxins. Sometimes we probably can't find the time to drink their nutritional equivalent in a delicious, nutrient-rich glass of juice. Therefore juicing is an important addition to a busy life style.

Vegetable juices are attracting more attention due to the nutritional & phytochemical value of many vegetables. Tomato juice & blends based on tomato have long been popular and account for over 90% of the non-vegetable juice trade. Most vegetables are not particularly high in sugars and tomato excepted are low in acids, resulting in PH values generally over 4.5 consequently, the juices are more subject to microbial spoilage and require either PH reduction, thus changing the vegetable character, or more stringent process to eliminate potentially dangerous microbes.

There are a number of units involved in converting whole fruits to the desired juices, puree or pulp. Vegetable handling depends upon the process design. In some circumstances, cleaning, sorting and inspection precede in plant storage or the operations can be repeated immediately prior to juicing.

Due to health consciousness in today's generation, the demand of fruits and vegetable juices are increasing day by day.

Among the fruit juice beverages are fruit juices (Pepsi's Tropicana), nectars (Dabur's Real) and fruit drinks (Frooti and Slice). All these are real, reconstituted from fruit pulps or concentrates. The leading fruit juice brands include Real, Onjus, Tropicana, Frooti, Jumpin. The fruit drinks are mainly based on oranges, mangoes, pineapples, grapes, apples, guava and tomato. They only differ in pulp content: the juices have over 85%, nectars (20% to 85%) and fruit drinks (less than 20%).

The branded fruit juices market inclusive of nectars is placed at about Rs 10 bn. The pure fruit juices are the preferred drink among the fruit drinks. This segment is growing at around 10% annually. The market for fruit juices is expected to grow to Rs. 7.50 bn by end 2009-10 from nearly Rs. 4.75 bn presently.

So there is very good domestic as well as export market for vegetable juices. New entrepreneurs can well venture in to this field.

*Cost Estimation:*

Capacity	:	12000 Bottles/Day
Plant & Machinery	:	129 Lakhs
Total Capital Investment	:	484 Lakhs
Rate of Return	:	52%
Break Even Point	:	33%

*Information*

- ★ One Lac / Lakh / Lakhs is equivalent to one hundred thousand (100,000)
- ★ One Crore is equivalent to Ten Million (10,000,000)
- ★ T.C.I. is Total Capital Investment
- ★ All costs/amount given in INR ₹
- ★ NPCS can provide customized Detailed Project Report on all the projects
- ★ Visit us at: [www.niir.org](http://www.niir.org) Email : [info@niir.org](mailto:info@niir.org)



### Packaged Drinking Water, Soda Water and Pet Bottles

"Bottled Water" means water intended for human consumption and which is sealed in bottles and other containers with no added ingredients except that it may occasionally contain safe anti-microbial agent. Now-a-days safe and pure drinking water is major necessity for human being. Bottled water industry, colloquially called, the mineral water industry, is a symbol of new life style emerging in India. While a large segment of the population is struggling to get access to potable water supply, a new generation - especially in the urban areas is getting accustomed to bottled water paying handsome prices.

Soda water is water which is carbonated and thus made bubbling by the addition of carbon dioxide gas under pressure. Soda water is sometimes used to dilute strong alcoholic drinks, e.g. cocktails such as a whisky and soda, or Campari and soda. It can also be drunk on its own. Soda water gets its name from the sodium salts it contains, said 'salty' compounds adding a distinct and pleasurable quality to many beverages of the alcoholic and non-alcoholic type.

PET is the most extensively recycled plastic of the present time. Bottled water is available in differently sized packaging from 200 ml (popular on flights) to 500 ml (a huge hit among the youth) to 1 liter and 2 liter. Despite the large number of small producers, this industry is dominated by the big players – Parle, Bisleri, Coca-cola, Pepsico, Parle Agro, Mohan Meakins. SKN Breweries bottled water in the country when it introduced Bisleri in India 25 years ago. Apart from domestic and commercial use of packaged water, the Indian Railways is a huge potential market. According to officials at Cheerio, the railway ordered 10,000 cases (of 12 bottles each) a day. In coming years the demand of packaged drinking water will be increased very rapidly, so there is a huge scope for new entrepreneurs to venture into this project.

The bottled water market is growing at a rapid rate of around 20% a year (down from 50 to 60%). At this growth rate, the Rs 7000 million per year market is estimated to overtake the soft drinks market soon. Multinationals, Coca-Cola, Pepsi, Nestle and others are trying to grab a significant share of the market. There are more than 180 brands in the unorganized sector. The

small players account for nearly 19% of the total market. The government decided towards end of the year 2000 to bring about stringent guidelines for packaged water. All companies were made to sell their products only under the BIS (Bureau of Industrial Standards) certification mark. The BIS certification was made mandatory for the segment from April 1, 2001. The bottled water is to be classified as "food" and has been brought under the Prevention of Food Adulteration Act. They would have to adhere to rules pertaining to colour, odour, taste, turbidity, total dissolved solids and aerobic microbial count.

There is a good scope and good market potential for new entrepreneurs to venture into this field.

***Cost Estimation:***

Capacity	:	Drinking Water – 17280000 Nos. Bottles(1 Ltr.)/Annum SodaWater–1008000 Nos. Bottles (600 ml)/Annum Drinking Water Jar – 720000 Nos. Jar (20 Ltr.)/Annum
Plant & Machinery	:	403 Lakhs
Cost of Project	:	695 Lakhs
Rate of Return	:	44%
Break Even Point	:	60%

**HDPE/PP Woven Sacks by Circular & Plain Looms  
with Lamination & Printing**

Packaging is both a symbol of society's consumption habits and reflection of its progress. The user expects it to have better strength, easier handling, to be lighter, more aesthetic, safer from a hygiene point of view, etc. In addition to its standard attributes, today's packaging just also contributes to protecting the environment, and certainly must not damage it besides being friendly to human health.

PP bags are made from virgin polypropylene plastic. These bags are versatile, attractive bags most commonly used for packaging small items such as beads & lollies. These bags can be sealed with a heat sealer like many other plastic bags. Polypropylene is one of those most versatile polymers available with applications, both as a plastic and as a fibre, in virtually all of the plastics and use markets.

Woven sacks are the best and most cost effective packaging solution for Industries like cement, fertilizer, sugar, chemicals, food, grains etc.

The HDPE/PP woven sacks are basically used for packing of cement and fertilizers companies, but presently also used for skimmed milk powder, sugar, grains and number of other products after value addition by making

usable them for other products. HDPE/PP woven sacks are 100% recyclable, does not break easily, reusable and having more tensile strength. The product will be directly sold to the end users as per their requirement. HDPE/PP woven sacks can be un-laminated, laminated and along with PE liners.

Woven sacks enjoy a good market in India and will continue to do so in the coming years. There are maximum use of PP woven bags in the fertilizer industry and cement industry, also partly used by chemical industry. In India fertilizer industries growth 2-5% and cement industries growth also about 6%. On the base it can be concluded that there is demand growth of non-woven sacks increase by 3% per annum. The demand of PP woven sacks is increasing day by day so, there lies a great scope for further expansion in near future.

#### *Cost Estimation:*

Capacity	:	3000000 Nos. 5000 Nos. Woven Sacks by Circular 5000 Nos. Woven Sacks by Looms / Day Sacks For Atta Each 50 Kgs. Cap
Plant & Machinery	:	Rs. 36 Lakhs
Total Capital Investment	:	Rs. 153 Lakhs
Rate of Return	:	50%
Break Even Point	:	36%

#### **Pouch Packing Automatic Plant (Flexible Packaging)**

In the field of packaging thermoplastic film has been widely accepted as efficient flexible packaging materials. Co-extruded multilayer blown film was introduced a few years back in the field of packaging. It is being used in the packaging of milk, edible oil, shampoo and for packaging of some of ready to eat snacks.

Plastic pouches are generally made of high molecular high density & low-density polythene film. Though there is wide variety of thermoplastic being used as packaging materials for general packaging purposes, films, rolls, bags pouches etc. made from various plastic materials are common. In India about 80% of co-extruded multilayer film is consumed by the plants for milk packaging as milk pouches and by vegetable oil mills as oil pouches.

Materials selection must reflect the economics of available Form-Fill-Seal machinery. The size of the pouch can vary from about ½" square to large pouches upto 2" or 3" on a side. There is a wide variation in possible sizes but in general the smallest pouches are the four-side-seal units while the larger are pillow pouch, ½" square to large pouches upto 2" or 3" on a side.

Pouches are also known as 'Mod'-Fascinating packaging gadgets, which provides a good deal of attraction in the packaging world. Pouches are modern

cheapest substitutes for filling milk, butter, ghee, oil and other fatty and non-fatty liquid foods. These are easy to handle and easily portable than heavy big size conventional container. Pouches are the containers of new generation technology with so many advantageous factors like cheap in price, flexible for handling, easily disposable, hygienically tested.

Packaging market size in India is about Rs 60 bn. Market size of PET/BOPP and other flexible film-based manufacturing segment is estimated at around Rs 25 bn. The cost impact of PET film and BOPP film on the overall packaging cost ranges from 35-85% depending on the product to be packaged.

The total installed capacity of the flexible packaging film industry is around 175,000 tonnes a year. The domestic demand is of the order of 177,000 tonnes including exports (of about 50%).

The domestic polyester manufacturers include Garware Polyester (23,000 tpa), Ester Industries (18,000 tpa), MTZ Polyester (12,000 tpa), Jindal Polyester (12,000 tpa), Verlon Polyester (2,500 tpa) and SRF's Polyester (3,500 tpa).

***Cost Estimation:***

Capacity	:	1200 MT/Annum
Plant & Machinery	:	128 Lakhs
Total Capital Investment	:	477 Lakhs
Rate of Return	:	46%
Break Even Point	:	33%

**BOPP Pressure Sensitive Self-Adhesive Tape**

BOPP adhesive tape, which is quite a recent development in the field of modern packaging, which is rapidly replacing the cello tape due to its excellent mechanical, optical and barrier properties. It is widely accepted for the decorative, flexible packing operations and has gained a spectrum of popularity. It is a combination of pressure sensitive adhesive and BOPP film. In dry form, it is an aggressively tacky at room temperature and adheres firmly to even rough surface. BOPP film is highly resistant to weather, heat, aerial oxidation and others. The pressure sensitive self-adhesive BOPP tape has various applications in packaging industry. It has very good properties.

BOPP Pressure Sensitive self adhesive tape is now widely used in substitute of cellophane tape. Due to its very good tearing strength and other mechanical properties, it is catching very good market. BOPP film has many applications as a packaging material. It is being used as wrap in biscuits, cigarettes, cosmetics, textile, food items, pharmaceutical and toiletries, as twist wraps in confectioneries and toffees, as bags and pouches in tea, coffee, readymade garments and hosiery, as strip packaging in pharmaceuticals and drugs etc. BOPP is also used in synthetic paper, tracing paper and

thermo laminating film. Currently it is being used in maps, produce manuals, visiting cards, art works and posters, metalized film and twistable film.

Packaging market size in India is about Rs. 60 bn. Market size of PET/ BOPP and other flexible film-based manufacturing segment is estimated at around Rs. 25 bn. The cost impact of PET film and BOPP film on the overall packaging cost ranges from 35-85% depending on the product to be packaged. BOPP pressure sensitive adhesive tape is recent development and substitute to cellophane adhesive tape. The product has very excellent market potential. At present there are only few units manufacturing the BOPP adhesive tape. But it has been assessed that there will be a tremendous demand of the product in the future. So a new entrepreneur can well venture into this field by installing a unit of BOPP pressure sensitive tape to satisfy present and future demand.

***Cost Estimation:***

Capacity	:	30,00,000 SQM/Annum BOPP Pressure Self Adhesive Tape
Plant & Machinery	:	44 Lakhs
Total Capital Investment	:	178 Lakhs
Rate of Return	:	42%
Break Even Point	:	40%

***Information***

- ★ One Lac / Lakh / Lakhs is equivalent to one hundred thousand (100,000)
- ★ One Crore is equivalent to Ten Million (10,000,000)
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- ★ All costs/amount given in INR ₹
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## Chapter 47

### PAINTS, PIGMENTS, ENAMELS, VARNISHES, SOLVENTS AND THINNERS

#### N.C.Thinner

N.C.Thinner is nitro cellulose thinner. It is mixture of esters, glycol, alcohol, aromatic solvents and ketones suitable diluents to all nitro product, it is manufactured for reducing lacquers before they are applied by different methods. Mainly used for solvent based nitro product.

The NC thinner is a blend of colorless low odor mineral spirits used for thinning oil base points. There are three types of thinner like-1. Slow evaporating, 2. Medium evaporating, 3.High evaporating, N.C.Thinner has an average evaporating.

N.C.Thinner has an average evaporation rate suggested for all nitro products when application is made in normal condition of temperature and humidity. N.C.Thinner quickly reduces the consistency of the lacquer to the required degree. It improves film smoothness of lacquers when applied either by spray or dipping thus extending excellent finish, lacquer dries without blushing, resin blush, pin holding and other surface defects. No orange peel developed after the evaporation of N.C.Thinner and therefore increase the tensile strength of the film along with its gloss NC thinner is manufactured through the continuous blending of the different chemicals.

N.C. Thinner is used as diluents in all nitrocellulose based coatings in all proportion as a Paint industry, Rubber industry, and Ceramic industry and Textile industry.

N.C. Thinner quickly reduces the consistency of the lacquer to the required degree. It improves film smoothness of lacquers when applied either by spray or dipping thus extending excellent finish. It is also lacquer dries without blushing, resin blush, pin holding and other surface defects. N.C. Thinner increases the tensile strength of the film along with its gloss.

There is a very good scope for such products and new entrepreneurs should venture in to this field.



***Cost Estimation:***

Capacity	: 12000 Kls/Annum
Plant & Machinery	: 340 Lakhs
Cost of Project	: 682 Lakhs
Rate of Return	: 26%
Break Even Point	: 37%

**Industrial Paints**

The paints industry in India has been growing at the rate of around 12% a year. The paints market has crossed the Rs 135 bn mark. By volume, the market is estimated at 1.4 mn tonne which is growing at an average annual growth of over 6 to 8% (against 12% by value). The unorganized sector, while having shrunk in the recent years, still commands a share of around 46% by volume and 35% by value. The paint industry in India is fragmented into over 80 players in the organized market alone. The number of unorganized and the small sector units is very large, close to 4000. The duty differential between the two sectors led to a rapid emergence of the small-scale sector in the past. The differential, however has virtually disappeared.

A coating is a film forming substance which protects substrate against potentially damaging elements in its environment, as well as enhancing its appearance. All consumer durable products, as well as all types of industrial equipments have to be coated in some way or another. New cars arrive coated. Paint is a liquid that converts into an opaque solid film when applied to a surface. It is used to protect and decorate object such as walls, metals etc. Paint is a combination of many chemical substances.

In India, the market for industrial paints (30% of the overall market) is growing faster than that for decorative paints. The paints majors were switching over to industrial paints sensing better prospects of the segment. The industrial paints are produced principally by the organized sector as this segment is relatively more technology driven.

There are number of industrial paints like auto refinish, wood coating, coil coating and industrial coating. The new entrepreneur venture into this industry will be successful due to huge demand of the product.

***Cost Estimation:***

Capacity	: 600 MT/Annum each
(i) Stoving Enamel for Metal	
(ii) Stoving Enamel for Furniture	
(iii) Polyester white coating enamel	
(iv) Wood coating	
Plant & Machinery	: 144 Lakhs
Cost of Project	: 396 Lakhs
Rate of Return	: 44%
Break Even Point	: 57%

### Paint Industry

Paint is a term used to describe a number of substances that consist of a pigment suspended in a liquid or paste vehicle such as oil or water. With a brush, a roller, or a spray gun, paint is applied in a thin coat to various surfaces such as wood, metal, or stone. Although its primary purpose is to protect the surface to which it is applied, paint also provides decoration.

The paint industry worldwide is classified into two segments viz. decorative and industrial segment in India constitutes nearly 70% of the market whereas the scenario is just the reverse in the developed countries. In India, the market for industrial paints (30% of the overall market) is growing faster than that for decorative paints. The paints majors were switching over to industrial paints sensing better prospects of the segment. The industrial paints are produced principally by the organized sector as this segment is relatively more technology driven.

Decorative Segment is dominated by the unorganized sector which now accounts for 70% of the total paint production as against 75% three to four years ago. The unorganized sector has an advantage over the organized sector since it is fully exempted from the 20% excise duty and other government levies. The major players in the decorative segment are Asian Paints, Kansai Nerolac (earlier Goodlass Nerolac), Berger Paints, ICI, Jenson & Nicholson, Shalimar Paints and Garware Paints. Each company has its relative strength in one or the other types of paints: Asian Paints has the widest range; Kansai Nerolac is strong in distempers; Berger Paints and ICI focus on emulsions; and Jenson & Nicholson in enamel paints. Kansai Nerolac has a higher proportion of industrial paints while others generally have a high proportion of decorative paints. Most of these major players, however, also produce other types of paints in which they are not dominant.

Paints and their allied products like enamels, varnishes, pigments, printing inks and synthetic resins protect national assets from corrosion. These are increasingly being and consumer durable sectors. Thus economic development has a direct bearing on the paint industry. More investment in housing and infrastructure would mean greater demand for paints as most people aspire for better lifestyles. There is tremendous potential for the paints manufacturers in India because as against an average per capita consumption of paints in India is very less. The Indian paints market may grow over the next decade at 15 to 20 per cent per annum. There is a very bright future in paint industry and new entrepreneurs should venture into this segment.

#### *Cost Estimation:*

Capacity	: 4500 MT/Annum
Plant & Machinery	: 150 Lakhs
Cost of Project	: 609 Lakhs
Rate of Return	: 42%
Break Even Point	: 50%

### **Water-Based Lacquers**

Water-based lacquers are wood finishing lacquers which are less toxic and more environmentally friendly. Lacquer is considered by many to be one of the best all around finishes for wood & other substrate. Today, lacquer refers to any finishing product that dries primarily by solvent evaporation. The emergence of water based lacquer finishes in the last decade, or so has been in response to the hazards associated with the conventional solvent-based lacquers. The solvents used to dissolve the lacquer resins & to thin the material for spraying are flammable & toxic to humans. So, switching to water based finishes has become a good alternation. Water based lacquers are very different products from solvent based lacquers. The water based lacquers finish is the most economical way to meet the environmental legislation.

Due to health risks and environmental considerations involved in the use of solvent-based lacquers, the water based lacquers came into existence. These lacquers are considerably less toxic and more environmentally friendly, and in many cases, produce acceptable results. More and more water-based colored lacquers are replacing solvent-based clear and colored lacquers in under hood and interior applications in the automobile and other similar industrial applications. Water based lacquers are used extensively in wood furniture finishing as well. All water-based finishes do contain an organic solvent or a combination of solvents. However, the amounts are significantly less than in solvent based finishes, usually less than 10% by volume. Some water-based lacquers in fact contain less than 2% by volume. These solvents are an essential component for film formation.

The majority of water-based finishes by definition are lacquers because they dry by solvent evaporation. Like any other lacquer, they are composed of resins & solvents. But most of the harmful & polluting solvents have been replaced by water, which is normally not a compatible solvent for any of the resins. To get water to become compatible with the resins, other chemicals are added to create an emulsion, a chemical term for a mixture of two substances that normally do not mix with each other. The chemicals ensure that the resin is evenly dispersed in the liquid carrier; chemicals called surfactants keep the non-compatible resins & water in a homogenous emulsion & improve the blowout of the finish. Surfactants are similar to soaps & create bubbles when the lacquer is applied. Defoamers are added to minimize the formation of bubbles. Water is the carrier used in water-based lacquers; it is what makes these products less hazardous & nonflammable.

Water-based finishes are very flexible and durable. The ability of a coating to "burn in" or "bite" into the coating underneath it is a means of that coating gripping itself to the undercoating is in a chemical way, not by mechanical means. The Indian paint industry is known for its competitiveness and also has a wide range of products. The fact that the medium to large-scale companies has over the last two decades been changing rankings is testimony

to the competitive nature of the industry. Today there are about 20 units registered with the DGTD. These constitute the organized sector of the paint industry. They account for about 50 per cent of the volume and two - thirds of the value of production. The balance production is attributable to about 900 units. Water-based lacquers are very promising set of finishes. The water-based lacquers finishes are equal to the solvent-based finishes, and superior in some ways. It is a best alternative finishes with reduced VOC (volatile organic content).

There will be a good demand for this product in the coming years. Any new entrepreneur venture in this field will be successful.

***Cost Estimation:***

Capacity	: 300 Kts/Annum
Plant & Machinery	: 35 Lakhs
Cost of Project	: 117 Lakhs
Rate of Return	: 42%
Break Even Point	: 69%

***Information***

- ★ One Lac / Lakh / Lakhs is equivalent to one hundred thousand (100,000)
- ★ One Crore is equivalent to Ten Million (10,000,000)
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## Chapter 48

### PAN MASALA, GUTHKA AND ZARDA

#### Pan Masala, Tobacco, Zarda & Kimam

Pan masala is consumed in large quantities by the people of rich class as well as the poor. Present manufacturers of Pan Masala are mainly from northern India. Increasing demand of the product all over the country as well as abroad has led the present manufacturer to increase their capacities and has opened new vistas for new entrepreneur.

#### *Cost Estimation*

Plant Capacity	: 600 Kgs/Day
Plant & Machinery	: Rs. 8.10 Lacs
Total Capital Investment	: Rs. 95.98 Lacs
Rate of Return	: 79.22%
Break Even Point	: 26.76%

#### Menthol Crystals

Menthol possesses a distinct peppermint flavour. It has a cooling and stimulating action that is useful for the manufacture of items like mouthwashes, toothpaste, chewing gum, jellies, cigarettes, alcoholic liquors, pharmaceutical and medicinal products. After-shave lotion often contain small amount of menthol, which enhance the mild astringency and refreshing coolness of such products. There is a rising demand for menthol crystals with population growth. Considering its diversified uses in the manufacture of a variety of products, this can be a profitable investment for entrepreneurs.

#### *Cost Estimation:*

Plant Capacity	: 100 Kgs./ Day
Plant & Machinery	: Rs. 9.06 Lakhs
W.C. for 3 Months	: Rs. 96.52 Lakhs
Total Capital Investment	: Rs. 132.78 Lakhs
Rate of Return	: 63.27%
Break Even Point	: 30.16%

### **Pan Flavouring (Kashmeri Sugandh)**

Pan Sugandh is a mixture of nuts, seeds, herbs and spices which's served after meal in India. Pan Sugandh is a balanced mixture of clove, cardamom, mint, tobacco, essence and other ingredients. It is an agriculture product with herbal properties also available in hygienic pack & pouches. The ingredients in pan sugandh vary widely depending on personal taste and region. Some pan sugandh mixtures even have herbs and spices with antibacterial properties which benefit oral health and pan sugandh also sometimes includes stimulant herbs to give people energy after eating.

Pan Sugandh is most often considered to be an item to aid digestion or used as a breath freshener for use after consuming highly spicy meals. It is widely used for removing bad odour to impart a pleasant feeling. It is also used for serving the guests and friends and in the parties and functions.

The pan flavouring has a good market potential in India and abroad. Simultaneously, if properly packaged and marketed in the name of natural flavouring these does exits a good market potential in India & abroad. The pan flavouring sector can have a good market potential in international market if consistency in quality and supply is ensured as far as domestic market potential is concern, the prevailing one is in tobacco, pan masala and gutka. Its horizon of market can be widening if surety about quality and assurances about consistency in supply could be made. At present, the Indian chewing industry is estimated to be Rs. 11,660 crores, consisting of three categories pan masala, Zarda and Gutka.

There is a good market potential for this product. Any new entrepreneur venture in this field will be successful.

#### ***Cost Estimation:***

Capacity	:	600000 Pcs. (100 grms) 1200000 Pcs. (50 grms.) per annum
Plant & Machinery	:	40 Lakhs
Cost of Project	:	124 Lakhs
Rate of Return	:	43%
Break Even Point	:	67%



### Carton Boxes

The materials now available for packaging are paper and paper products, metal containers, foils, glass, plastics-rigid and flexible, cellulose film, textiles, including Jute, woven plastic and wood. Among the packaging materials paper and paper based products continue to occupy a predominant place. Corrugated and solid fiber board boxes have replaced the conventional wooden boxes as transport containers, because of their light weight and satisfactory strength. Carton boxes are used by pharmaceutical companies, health and beauty products manufacturers, processed food packers, garments manufacturers, liquor cartons, agarbatti packaging and packaging of engineering parts. So, there is very good demand of carton boxes. Any new entrepreneur can enter in this field will be successful.

#### *Cost Estimation:*

Capacity	:	4000 Nos./Day or 1200000 Nos./Annum
Plant & Machinery	:	26 Lakhs
Total Capital Investment	:	183 Lakhs
Rate of Return	:	45%
Break Even Point	:	33%

### Paper from Waste Paper

Paper is one of the most usable consumer items which has largely used throughout the world. It is generally prepared from cellulosic material by treating it with different type of chemicals and then process through roller and driers to make a suitable quality paper. The quality of paper depends upon the end use of the paper. As the demand for paper has increased, more timber has been needed to meet the demand for wood pulp. By using waste paper to produce new paper the demand can be met to some extent. Waste paper is an important raw material for paper and paper board manufacturing. Consumption of waste paper in India is very low compared to advanced countries. This is mainly due to lack of organized collection. However it is estimated that 25% of all paper consumed in India is now recycled.

It is believed that waste paper might become a major a "raw material" for paper and pulp industry in the world since soft wood is becoming increasingly scarce. Waste paper collection provides regular employment to a substantial number of people, particularly lower income group, in cities. Waste paper in this country is generally obtained from printing, paper converting and packaging industries and from street sweepings. This type of waste paper is of low quality. About 80 percent of available waste paper pulp is used in the manufacture of paper boards. Small scale units depend almost entirely on waste paper as raw material. In India the use of recycled fibre is less in compared to developed countries. So there leaves a lot of ample space for new entrepreneurs to venture into this field. There is a very good scope to venture into this field.

***Cost Estimation:***

Capacity	: 15000 MT/Annum
Plant & Machinery	: 868 Lakhs
Total Capital Investment	: 1663 Lakhs
Rate of Return	: 39%
Break Even Point	: 47%

**Paper Bags from Waste**

Paper bags are more popular and good in appearance. Paper bags are gradually replacing the plastic bags from the market in India. Plastic bags are cheap but they cause much destruction to the environment. For this reason more and more companies in India are offering paper bags to their customers for carrying purpose. Paper bags look more attractive and they come in a variety of shapes, size, colour and design. Paper bags are preferred more today because it makes a style statement and adds to one's appearance. In addition to that, paper bags can carry a lot more weight than plastic bags. All the waste product produced in the earth except plastic base can be easily biodegradable. In a word it can be used for land filling material or for the land development.

Paper based products are totally ecofriendly products, which help us to keep the balance of natural climate. There are variety of products can be manufactured such as paper dish paper glass, paper for greetings, card, paper for different types billing, paper used for making paper bags of different varieties which can be used for cement filling bags, again another which can be used as shopping bags.

Kraft paper, Brown paper or wrapping paper is made from variety of raw materials, e.g. Bagasse, ground wood, straw, waste paper, in various combinations. 'Kraft' means strength and it is leading paper for wrapping heavy bundles. Kraft papers or brown papers are strong and flexible and quality kraft paper are made by the 'Kraft' chemical process or also known

as sulphate process. They are normally sized with sizing agents & additives are added, and not bleached. The colour is only a natural colour. They are used in wrapping paper bags, liners corrugated sheets.

Paper bags are manufactured from multiple plies of paper. Natural kraft paper is used most commonly. Extensible Kraft paper is less commonly used, but provides a higher level of strength than Natural Kraft. The improvement in strength is due to the manufacturing process for the paper, not the conversion of the paper into bags.

Bleached white Kraft paper is also used for bags to improve the appearance of the bag and the customer's perception as to the quality expensive than natural kraft & usually a bleached kraft outer ply is used with natural kraft inner plies. Bleached kraft has reduced strength due to the bleaching process.

The Indian paper industry is highly fragmented, with capacities scattered over a wide spectrum of units ranging from 5 tpd to 600 tpd capacity. Of the total installed capacity, 43 per cent is dependent on forest based raw materials, 28 per cent on agro based raw materials and the remaining 29 per cent on other materials, including secondary fibre. Sustained availability of fibre resources is the major long-term concern for the growth of the paper industry.

There is very good scope in this sector for new entrepreneurs.

***Cost Estimation:***

Capacity	:	1200 MT/Annum 60000 Nos. Paper Bags/Day Each Bags Wt. 65 grams
Plant & Machinery	:	184 Lakhs
Total Capital Investment	:	433 Lakhs
Rate of Return	:	48%
Break Even Point	:	43%

**Printed Paper Shopping Bags**

Printed-paper shopping bags are more popular and good in appearance. They are now going to replace the poly bags. There is lot of use of poly bags in modern life due to various positive reasons. Poly bags are light and easy to handle. It can bear high strength to carry the useful material. But ruling of plastic will now change their ways, since there is only one disadvantages lying in the plastic i.e. it will not destroy in the earth. It cannot be used for land development work. All the waste product produced in the earth except plastic base can be easily converted to earthy material. In a word it can be used for land filling material or for the land development. The plastic base materials are not eco-friendly product. On that basis world of science is now thinking to develop eco-friendly plastic.

Paper based products are totally eco-friendly products, which help us to keep the balance of natural climate. There are variety of products can be manufactured such as paper dish paper glass, paper for greetings, card, paper for different types billing, paper used for making paper bags of different varieties which can be used for cement filling bags, again another which can be used as shopping bags.

Paper bags are manufactured from multiple plies of paper. Natural Kraft paper is used most commonly. Extensible Kraft paper is less commonly used, but provides a higher level of strength than Natural Kraft. The improvement in strength is due to the manufacturing process for the paper, not the conversion of the paper into bags.

Bleached white Kraft paper is also used for bags to improve the appearance of the bag and the customer's perception as to the quality expensive than natural Kraft & usually a bleached Kraft outer ply is used with natural Kraft inner plies. Bleached Kraft has reduced strength due to the bleaching process.

Paper shopping bags are totally eco-friendly products and new entrepreneurs should venture into this field.

***Cost Estimation:***

Capacity	:	3000000 Nos./Annum
Plant & Machinery	:	34 Lakhs
Total Capital Investment	:	108 Lakhs
Rate of Return	:	46%
Break Even Point	:	40%

**Kraft Paper from Waste Carton Boxes**

Kraft paper, Brown paper or wrapping paper is made from variety of raw materials, e.g. Bagasse, ground wood, straw, waste paper, in various combinations or alone, waste carton boxes etc. 'Kraft' mean strength and that is why its name. It is leading paper for wrapping heavy bundles. After corrugation it is used in many types of packing and it is an important packaging material.

Kraft papers or brown papers are strong and flexible and quality Kraft paper are made by the 'Kraft' chemical process or also known as sulphate process. They are normally sized with sizing agents & additives are added, and not bleached. The colour is only a natural colour. They are used in wrapping paper bags, liners corrugated sheets.

Kraft paper exists in many grades. Here colour and surface finish are of secondary importance and the main requirements are that the paper should be strong and that it should provide some protection to wrapped goods, especially the rain this protection is achieved mainly by engine sizing. The

fibres should be long, strong & beaten to give a sheet having maximum strength. Bleaching is avoided since it tends to reduce strength and is normally unnecessary for such paper and strong brown Kraft pulp is widely used. Brown wrapping papers are frequently machine-glazed (abbreviated MG) by allowing them to dry with one side in contact with a polished, beated cylinder, much as a photographer glazes his prints. The side in contact with the heated cylinder receives a bright glossy finish, while the other side remains rough. Paper is a biodegradable material; this means that when it goes to landfill it will rot; bacteria will form and produce methane. This is a powerful greenhouse gas that is 23 times more potent than CO<sub>2</sub> (carbon dioxide) and contributes to climate change. We currently recycle 66% of the paper we use.

Manufacturing virgin (brand new) paper uses more energy than making recycled paper, but varies dependent on the grade or type of paper being made. By using waste paper to produce new paper disposal problems are reduced. Moreover producing recycled paper involves between 28 - 70% less energy consumption than virgin paper and uses less water.

The world consumption of paper and paperboard is estimated at over 300 mn tonne a year. It is constituted broadly of 30% of cultural papers (writing and printing), 14% of newsprint, and the balance of kraft and packaging paper including paperboards. The Indian production is about 2 to 3% of the global total. The overall value of the market is estimated at Rs 250 bn. In volume terms, the segment is presently estimated at over 6.9 mn tonne.

However, despite all the announced capacity expansions, India would still have a supply gap. The Indian market is today growing at three times the rate of the global average. India's paper industry plans to invest USD 2.5 bn in the next two three years to add 2 mn tpa of paper and paper products production capacity. It will also help in improving cost-competitiveness.

The domestic demand for paper is growing at around 8% for the last couple of years in line with GDP growth. However, the per capita consumption in the country is only 8 kg a year. As a result of this low base, the long-term growth prospects are bright. The government's thrust on education and special schemes are expected to help the industry in future.

There is a very good scope and ample space for new entrants in this field.

***Cost Estimation:***

Capacity	: 15000 MT/Annum
Plant & Machinery	: 565 Lakhs
Cost of Project	: 943 Lakhs
Rate of Return	: 43%
Break Even Point	: 56%

### **Paper Napkins, Toilet Roll & Facial Paper from Tissue Paper Rolls**

Hygiene is an essential component of healthy living, integral to achieving health and preventing disease. Not just selecting the right food choices but also cooking & consuming them in a hygienic way is equally important in preventing the infectious diseases. Adopting hygienic practices and promoting hygiene in the community, schools and workplace prevents innumerable infectious disease. The hygiene-related products are an important part of our daily life. These products promote a hygienic lifestyle. These include automatic deodorizers, tissue paper, eco friendly tissues and towels, disinfectant and sanitizers. The major hygiene products tissues include facial tissues, toilet rolls, napkins and serviettes, kitchen towels, cleaning solutions, hand sanitizer, wet wipes, liquid handwash etc.

In a modern age people are more prone to sophisticated mode of maintaining health and hygiene conditions of their body through the contiguous of cosmetics and their allied measure. This is an elegantly achieved by the application of wet face freshener tissue. This is very economical item and portable .It can be easily carried in pocket while going in a car, rail, and flight.

Tissue paper is often used for direct inside part wrapping as in jewellery, liquor, fruit and florist trade, various other tissue papers are used for specific purpose. Napkins are manufactured from tissue paper are becoming popular with catering industry due to its manifold uses. These are absorbent, hygienic, and light and can be held with attractive printing. There are many kinds of raw material which can be used in the production of tissue paper such as wood pulp or sorted waste paper, cellulose pulp from straw, linen, cotton & rags, jute etc. Facial tissue paper through recently introduced in Indian market is fast becoming popular with the public. The following brief utility of paper napkin obtained from tissue paper may be enumerated.

The potential for growth in the personal care hygiene sector is huge. The Indian Economy is surging ahead by leaps and bounds, keeping pace with rapid urbanization, increased literacy levels, and rising per capita income are some of the key social drivers thus giving a strong signal to the possibility of Indian personal care industry realizing its huge potential in the near future.

Now-a-days the demand of tissue paper is increasing day by day, so there is wide scope for new entrepreneurs to venture into this project.

#### ***Cost Estimation:***

Capacity	:	3000 MT/Annum 6 MT Paper Napkins 2 MT Toilet Rolls 2 MT Facial Paper
Plant & Machinery	:	41 Lakhs
Total Capital Investment	:	923 Lakhs
Rate of Return	:	49%
Break Even Point	:	25%



### **Paper from Shoot of Banana Plant**

Banana paper is best described as a revolutionary product and is much sturdier than ordinary pulp paper and made from natural, biodegradable product. This paper is popular among those who appreciate the concept of using a natural paper material in an original way. Banana paper is tree free and uses no toxic chemicals acids or chlorine in the manufacturing Process. Banana paper is promoted as a completely environmentally friendly product. This paper can be either handmade or made by industrialized machine.

Banana paper is used in two different senses; to refer to a paper made from the bark of the banana tree, mainly used for artistic purposes, or paper made from banana fiber, obtained from an industrialized process i.e. from the stem and the non utilized fruits. The characteristics that make Banana fiber particularly useful for Industrial Products include it's resistance to fire, oil and water.

Banana plantations are traditionally maintained to produce bananas. Banana is a fast growing and high biomass-yielding plant. Now environmental friendly, banana paper is being made from banana palm fibre. While the material is new in fibre industry, as it was previously considered a waste product, it is now providing an endless possibilities including saving old growth forests. It has a good potential alternative resource to the fibre and paper industry.

Banana paper has got very wide usage in the units like: 100% chemical free tissue paper, filter paper, paper bags, craft papers, greeting cards, wedding cards, carry bags etc., products that are made out of banana paper has very good market. The Indian Paper Industry accounts for about 1.6% of the world's production of paper and paperboard. The estimated turnover of the industry is more than Rs. 25,000 crores approximately.

So, there is good scope for new entrepreneurs to venture into this field.

#### ***Cost Estimation:***

Capacity	: 1500 MT/Annum
Plant & Machinery	: 86 Lakhs
Total Capital Investment	: 566 Lakhs
Rate of Return	: 45%
Break Even Point	: 36%

### **Exercise Note Book and Offset Printing**

Exercise notebook, registers, pads and files are widely known and vastly used as day to day products. Exercise notebooks are of different shapes and sizes, accordingly. Used for different purposes. With the growth of education among the masses particularly in rural areas, industrialization and commercialization with in the country, the demand of stationery, notebook,

has been increasing very fast. Other factors like population growth, compulsory primary education Govt. incentives, and age statistics have only increased the demand. Now these items are essential almost for everyone. With the growing population, demand of writing and printing papers in the form of registers, notebook, paper pads etc. has very bright future scope. Any new entrepreneur can venture in to this field.

Offset printing, also referred to as offset lithography, is a type of printing process used by virtually all large commercial printers. Offset printing is a technology that has been around for over 100 years now. Offset printing produces a finished product where the ink is completely flat on the paper with a matte finish. The term "Offset" gets its name from the fact that the plate cylinder which holds the art information does not come in contact with the paper. Offset printing is the most commonly used printing method today. Over 40% of all print jobs are carried out using offset printing.

Offset printing can be done on a web printing press, one that use huge rolls of continuously fed paper, or a sheet fed press that, uses sheets of paper. Both types of presses produce printed materials that can be cut to size after printing. Offset printing uses all of the latest technology in printing.

Offset printing works because water and the inks used in the printing process do not mix. The images to be printed are created on the computer and then "burned" onto metal plates using a chemical developing process similar to photography. The metal plates are dampened with water which adheres to the areas without images. The ink is added next, one color at a time, where it sticks to the areas with images. The most modern systems use a direct-to-plate system in which the images are burned directly to the metal plates; the omission of a secondary step saves time and money. The offset printing process requires a fairly large investment in equipment and set up. However, once the infrastructure is in place, offset printing itself is relatively inexpensive. Thus, the initial investment in an offset printing press can be fairly high but the actual cost of offset printing turns out very economical. There is a very good scope in this segment. New entrepreneurs should venture into this field.

***Cost Estimation:***

Capacity	:	7500 Nos. Exercise Note Books/Day and Offset Press for Printing Job Work
Plant & Machinery	:	35 Lakhs
Total Capital Investment	:	2 Crore
Rate of Return	:	48%
Break Even Point	:	46%

## Chapter 50

## PHARMACEUTICALS, DRUGS AND FINE CHEMICALS

### Ciprofloxacin HCl–Cipro

Ciprofloxacin belongs to a class of drugs called quinolone antibiotics. It is a second generation fluoroquinolone antibacterial. It works by stopping the growth of bacteria and kills bacteria by interfering with the enzymes that cause DNA to rewind after being copied, which stops synthesis of DNA and of protein. Ciprofloxacin interacts with other drugs, herbal and natural supplements, and thyroid medications. Ciprofloxacin was first patented in 1983 by Bayer A.G. and subsequently approved by the U.S. Food and Drug Administration (FDA) in 1987. Ciprofloxacin hydrochloride, USP, a fluoroquinolone, is the monohydrochloride monohydrate salt of 1 cyclopropyl 6 fluoro 1, 4 dihydro 4 oxo 7 (1 piperazinyl) 3 quinolinecarboxylic acid. Ciprofloxacin inhibits an enzyme called DNA gyrase that is an essential component of the mechanism that passes genetic information onto daughter cells when a cell divides.

#### Product Characteristics

Trade names	- Ciloxan, Cipro
Mol. Formula.	- $C_{17}H_{18}FN_3O_3 \cdot HCl \cdot H_2O$
Molecular weight	- 385.8
Appearance	- Powder; does not mix well with water.
Description	- Antibiotic
Shelf life	- Good
Bioavailability	- 69%
State	- Solid, Divided solid

#### Applications

Ciprofloxacin is used to treat a number of infections including: infections of bones and joints, endocarditis, gastroenteritis, malignant otitis externa, respiratory tract infections, cellulitis, urinary tract infections, prostatitis, anthrax,

chancroid, among others. Ciprofloxacin is available as tablets, intravenous solutions, eye and ear drops. It can also be used to treat some sexually transmitted infections (STIs), some forms of infectious diarrhea, and typhoid fever. The extended release form of ciprofloxacin is used to treat bladder and kidney infections.

#### **Global Demand**

- ★ India accounts for less than two per cent of the world market for pharmaceuticals, with an estimated market value of US\$10.4 billion in 2007 at consumer prices, or around US\$9 per capita.
- ★ Espicom's market projections put the market at US\$15.6 billion by 2012 by assuming a modest but sustainable market growth of around 8.4% per year.
- ★ However, McKinsey has predicted that just the Indian domestic market alone is expected to grow from US\$6.3 billion in 2005 to about US\$20 billion by 2015.
- ★ The Indian pharmaceutical industry is the fourth largest in the world in terms of volume of output and thirteenth in domestic demand. However, the Indian industry, valued at USD 17 bn in represented just over 1% of the global pharmaceutical industry (USD 1700 bn) in value terms. The domestic market is estimated at Rs 680 bn.

The demand of Ciprofloxacin in the market is immense and therefore its market position is splendid. Hence it is an excellent field to venture.

#### ***Cost Estimation:***

Capacity	: 180 MT/ Annum
Plant and Machinery	: 225 Lakhs
Cost of project	: 549 Lakhs
Rate of return	: 43%
Break Even Point	: 59%

#### **Pharmaceutical Unit (Tablet, Syrup & Injectables)**

The Indian pharmaceutical industry today is in the front rank of India's science based industry with wide ranging capabilities in the complex field of drugs manufacture and technology. The Indian pharmaceutical sector is highly fragmented with more than 20,000 registered units. It has expanded drastically in the last two decades. The leading 250 pharmaceutical companies control 70% of the market with market leader holding nearly 7% of the share. It is an extremely fragmented market with severe price competition and govt.

price control. The pharmaceutical industry, with its rich scientific talents and research capabilities, supported by intellectual property protection regime is well set to take on the international market.

The demand of pharmaceutical products is increasing very fast. So, any new entrepreneur can venture in to this field.

***Cost Estimation:***

Capacity	: 9000000 Nos./Annum (Bruphen Tablets) 900000 Bottles/Annum (Paracetamol Syrup) 1200000 Bottles/Annum (Dextrose Saline) 1800000 Nos./Annum (Streptomycine Injection)
Plant & Machinery	: 85 Lakhs
Cost of Project	: 350 Lakhs
Rate of Return	: 42%
Break Even Point	: 56%

**Gelatin Sponge**

Gelatin sponge is a sterile compressed sponge has haemostatic properties and is precisely used for controlling bleeding. By virtue of its versatile usage for haemostatic function in dental treatment, in gaining eminence and being a innovative product, its demand is increasing day by day. In view of the horizons of its field of application, the future scope of this product is also bright.

To cope up with the increasing demand of gelatin sponge, the imperative need of the hour is to set up more number of units for its manufacture. Thus, in the limelight of the facts enumerated above, a new entrepreneur can venture into this field. It is a lucrative project with bright scope.

***Cost Estimation:***

Capacity	: 6000000 Nos./Annum
Plant & Machinery	: 91 Lakhs
Cost of Project	: 269 Lakhs
Rate of Return	: 46%
Break Even Point	: 49%

**Pharmaceutical Grade Sugar**

Pharmaceutical grade sugar can be manufactured by using cane beet or sugar cane itself. This is the more pure form of sugar may not contain sulphur and heavy toxic material like lead arsenic and mercury etc. This is used mainly in preparation of pharmaceutical and food products. There are few companies in organized sector manufacturing pharmaceutical grade sugar.

Dhampur is one of the leading manufacturers. There is good domestic as well as export market for the pharma grade sugar.

It can be concluded that there is a very good scope for new entrepreneurs if they produce the product with European competitive price.

***Cost Estimation:***

Capacity	: 15000 MT/Annum
Plant & Machinery	: 293 Lakhs
Cost of Project	: 613 Lakhs
Rate of Return	: 45%
Break Even Point	: 53%

**Glucose Saline**

Dextrose is a carbohydrate caloric agent. Glucose, also known as dextrose, is a simple sugar that can be found in nature and are chemically identical. Dextrose is simply in lay terms sugar water and is generally used in those patients who have a very low blood glucose level or are unable to eat for some reason. It is a short term treatment generally. D5NS (Dextrose 5% in normal saline) is hypertonic, meaning it has a higher solute concentration than tissues, so it can be used to help draw fluids out of oedematous (fluid-swollen) tissues. Dextrose (glucose) 5% and normal saline (sodium chloride or common table salt 8.5 grams per 100 ml of distilled water), have the same tonicity or concentration of the rest of the body fluids, that is, they will do no harm to the rest of the fluids of the body whereas Saline or 9% NS IV solution is used as the universal fluid replacement in dehydrated individuals, it is the same composition as the body's normal fluid and most IV medications can safely be mixed with or push through saline. Dosage of dextrose depends on the age, weight, clinical condition, and fluid, electrolyte, and acid-base balance of the patient.

Dextrose is readily metabolized; it increases blood glucose concentrations and provides calories. Dextrose may decrease body protein and nitrogen losses, promote glycogen deposition, and decrease or prevent ketosis if sufficient doses are given. Since dextrose is usually metabolized to carbon dioxide and water, administration of a solution of dextrose and water is equivalent to providing the same volume of free water. Following oral administration, dextrose, a monosaccharide, is rapidly absorbed from the small intestine principally by an active mechanism. In patients with hypoglycemia, increases in blood glucose concentration usually occur within 10–20 minutes and peak at about 40 minutes after oral administration of dextrose.

In medicine, saline (also saline solution) is a general term referring to a sterile solution of sodium chloride (NaCl, more commonly known as salt)



in water but is only sterile when it is to be placed intravenously; otherwise, a saline solution is a salt water solution. Thus, an intravenous infusion, a saline solution is typically mixed with dextrose or glucose to reduce any complications from infusing saline solution and to reduce the amount of sodium circulating through the blood stream. This works particularly well as a water and nutrient supplement to sustain hospitalized patients who are unable to eat or drink or who have suffered dehydration from severe vomiting or diarrhea.

In present era, people are becoming very health conscious as the infection through air, water, food is prevailing across the country to the maximum. As hospitals are increasing day by day, doctors also prefer to use distilled water ampoules.

There are several in organized and private sectors are engaged in the manufacturing of different grade dextrose saline solution. The demand growth is about 5% in each and every year. The entire demand gap is fulfilled by the domestic manufacturers.

There is scope of dextrose saline bottle. New entrepreneur may launch in this field will be successful.

***Cost Estimation:***

Capacity	:	3600 Thousand Bottles Each Bottles 500 ml/Annum
Plant and Machinery	:	66 Lakhs
Cost of Project	:	153 Lakhs
Rate of Return	:	42%
Break Even Point	:	59%

***Information***

- ★ One Lac / Lakh / Lakhs is equivalent to one hundred thousand (100,000)
- ★ One Crore is equivalent to Ten Million (10,000,000)
- ★ T.C.I. is Total Capital Investment
- ★ All costs/amount given in INR ₹
- ★ NPCS can provide customized Detailed Project Report on all the projects
- ★ Visit us at: [www.nitr.org](http://www.nitr.org) Email : [info@nitr.org](mailto:info@nitr.org)

### PPR Pipes and Fittings

PPR pipe is known polypropylene pipes, Polypropylene random copolymer with a pipe by extrusion, injection molding a tube. PPR Pipe is used in most home improvement projects a water supply pipeline. PPR pipe interface with hot-melt technology, are completely integrated into the pipe together, so once installed pressure tested and will not be further leakage, high reliability. This does not mean there is no defect PPR pipes water pipes, heat resistance, a less pressure more long-term working temperature should not exceed 70°C; each piece of limited length, and cannot bend construction, long distance or if the pipeline the corner and more should be used in the construction of a large number of joints; pipe fittings cheap but relatively high prices. Speaking from the overall performance, PPR pipe is the high cost of pipe, water pipe so as decoration material of choice for transformation. Processed from thermoplastic polyolefin into pipes & fittings with superior chemical & physical properties, PPR is environmentally friendly and is produced in line with energy conservation international standards. Its characteristics include being lightweight, heat resistant, anti-corrosive, easily installed, has low thermal conductivity, durable connection and fittings.

### Characteristics of PPR Pipes

- ★ PP-R raw materials for elements only carbon and hydrogen elements, there is no harmful toxic elements in the existence of health, reliable, not only for hot and cold water pipes, can be used to clean drinking water systems.
- ★ PP-R pipe thermal conductivity coefficient of 0.21w/mk, only steel pipe, 1/200.
- ★ PP-R pipe Vicat softening point of 131.5°C. Maximum working temperature of up to 95°C, water supply and drainage to meet the construction specifications require the use of hot water system.

- ★ It has long service life. PP-R pipe in working temperature 70°C, working pressure (PN) 1.0MPa conditions, the service life of up to 50 years; at room temperature (20°C) service life of up to 100 years.
- ★ PP-R has good welding properties, pipe, pipe fittings can be used hot-melt and fused connections, easy installation, connection reliability, its connecting parts of pipe strength is greater than the strength of its own.
- ★ PP-R waste through clean, broken recycling in the pipe, pipe fittings production.

### Application

PPR pipe has a wide range of applications:

- ★ PPR is frequently utilized as hot and cold water facilities for commercial buildings
- ★ food, chemical, electronic and other industrial pipe network
- ★ corrosive liquid pipe network
- ★ potable water supply
- ★ air-conditioning pipelines, residential heating system
- ★ compressed air pipes network for factories
- ★ swimming pools
- ★ solar energy and agriculture industries
- ★ Residential cold and hot water system
- ★ Underground heating system
- ★ Conveyor of industrial water and chemical materials
- ★ Sanitary and pure water pipelines
- ★ Hot water recycling system
- ★ Compressed air pipelines
- ★ Drink manufacturing and conveying system
- ★ Other industrial and agricultural pipe

### Market Scenario

Considerable growth in the use of PPR (Random Copolymer Polypropylene) pipe systems in new buildings has resulted in a surging demand for PPR material in expanding markets across Eastern Europe, North Africa, and Asia. According to the relevant data plastic sheet, plastic pipe and plastic-steel windows and doors are subject to market interest rate of 53% above market demand, an upward trend. In Western Europe, the advantages of PPR pipes are sometimes outweighed by the higher labour costs incurred when fitting the systems, but, in markets with a lower cost of labour, PPR's advantages are driving a big increase in demand. As per industry estimates, global demand for plastic pipe is expected to increase 4.5% annually to 8.1 billion metres

in 2012 in weight terms, consumption is projected to expand 4.6% per year to 18.1 million metric tons.

The applications and demand of PPR pipes and fittings in the market is immense and therefore its market position is splendid. Hence it is an excellent field to venture.

***Cost Estimation:***

Capacity	:	5760 MT PPR pipes/Annum 14400000 Pieces/ Annum, PPR fitting
Plant and Machinery	:	288 Lakhs
Cost of project	:	913 Lakhs
Rate of return	:	40%
Break Even Point	:	70%

**HDPE Pipes & Fittings**

Provision of drinking water supply or in other words 'piped water' supply to urban and rural population, constitutes an important aspect of developmental programmes in many countries. Among many materials for pipes and fittings, plastics, though of recent origin, have offered vast potentialities both economical and technical, for exploitation by the engineers, architects builders of plastic materials, polyethylene (low and high density) and unplasticized PVC (Rigid PVC) have been the prime contender though to a fairly smaller extent, propylene and ABS have made their appearance in this field. The HDPE pipes and fittings have a high degree of corrosion resistance are light in weight. Central Public Works Departments, State Public Works Departments, Urban Development Authority, Municipal Board, Water Works, Jal Nigams, Process Industries, Power Houses are the bulk consumers of the HDPE pipes and fittings.

Uses of HDPE pipes and fittings are increasing day by day. So there is good scope for new entrepreneurs.

***Cost Estimation:***

Capacity	:	900 MT/Annum
Plant & Machinery	:	47 Lakhs
Cost of Project	:	195 Lakhs
Rate of Return	:	42%
Break Even Point	:	60%

**PVC Pipes**

**(Size ½", 1", 1½", 2", 2½," 3")**

PVC pipes are produced by extrusion process followed by calibration to ensure maintenance of accurate internal dia with smooth internal boxes. The

pipes generally come in length of 6 meters. A wide range of injection moulded fittings including tees, elbows, reducers, caps, pipes saddles, inserts and threaded adaptors for pipe sizes 15-150 mm are available. The PVC pipes are much lighter than cast iron or A.C. pipes. Because of their light weight PVC pipes are easy to handle, transport and install. It is also lower in cost in comparison with conventional pipes of equal dimensions and pressure rating. PVC pipes are used in water distribution, sewer systems, conduit and ducting, agriculture irrigation and drainage etc. it is widely used in residential construction because of the ease of joining with solvent glues. The PVC products are getting more and more popularity over the world, so setting of this unit will be beneficial for new entrepreneurs.

***Cost Estimation:***

Capacity	:	1800000 Mtrs/Annum PVC Pipe Size 0.5", 1", 1.5", 2", 2.5", 3" each capacity 1000 Mtrs/Day of each diameter
Plant & Machinery	:	208 Lakhs
Total Capital Investment	:	1014 Lakhs
Rate of Return	:	52%
Break Even Point	:	34%

***Information***

- ★ One Lac / Lakh / Lakhs is equivalent to one hundred thousand (100,000)
- ★ One Crore is equivalent to Ten Million (10,000,000)
- ★ T.C.I. is Total Capital Investment
- ★ All costs/amount given in INR ₹
- ★ NPCS can provide customized Detailed Project Report on all the projects
- ★ Visit us at: [www.niir.org](http://www.niir.org) Email : [info@niir.org](mailto:info@niir.org)

### Cut-Rose (Floriculture)

Floriculture, or flower farming, is a discipline of horticulture concerned with the cultivation of flowering and ornamental plants for gardens and for floristry, comprising the floral industry. The development, via plant breeding, of new varieties is a major occupation of floriculturists. Flowers are symbol of beauty, love, affection, etc. Besides their aesthetic value, they are important for their economic uses, such as for cut blooms and for extracting perfumes and other products. In our country, flowers are sanctified and are commonly used in worshipping the deities in our homes and temples. Rose is queen of flowers, it come from the latin word *Rosa hybrid* (family: *Rosaceae*). There are several thousand, varieties of roses and several hundred new ones are being added every year. The choice of Varieties depends mainly on the climate and the soil of the growing region for cut flowers, exhibition, garden display etc. and on personal or family preferences. There are following few varieties of Roses are commonly available in the market. The production of cut flowers is specifically known as the cut flower industry. Farming flowers and foliage employs special aspects of floriculture, such as spacing, training and pruning plants for optimal flower harvest; and post harvest treatment such as chemical treatments, storage, preservation and packaging. In Australia and the United States some species are harvested from the wild for the cut flower market.

### Applications

- ★ The rose is used for purposes of decoration during festivals, and for personal adornment.
- ★ The flowers are strung into garlands and offered in temples.
- ★ During roughly to 60-70 per cent total production in the country is used for the production of rose water.
- ★ Smaller quantities are consumed in preparing attars, gulkand and hair oils.



- ★ A part of the crop of Edward roses is used for the production of rose water
- ★ Used for the production of method altars and hair oils.

### Global Demand

World trade in cut flowers: about 14.1 billion per annum

Commercial floriculture however is of recent origin. A constituent increase in demand for cut and potted flowers has made floriculture as one of the important commercial trades in Indian agriculture. Emphasis has been shifting from traditional flowers to cut flowers for export purposes. India is a leading grower of roses. Karnataka continues to be the leader, accounting forever 50 % of the natural rose production. Bangalore has around 35 floriculture units producing roses. Floriculture has an annual growth potential of 25 to 30 %. Of late, large scale commercial companies have started joint ventures with foreign companies to invest in the floriculture sector. The government has invited foreign investment in floriculture, particularly in the areas of refrigerated storage and transportation facilities essential to ensure that flowers do not perish to transit. Of course, the flower exporters want an increase in airfreight subsidy and lower rates for electricity. Floriculture is capable of attracting/retaining a large number of progressive rural populations on in farming. India's share of the global floriculture market is around \$60 million, which is only 0.3 percent.

The Rs. 3000 million floriculture industry of India has 60 units across the country. India's floriculture industry is of recent origin. Currently around 210 hectares are under floriculture cultivation, with a capacity to produce around 300 million stems of flowers. Indian flowers can match the best in the world. Of course the performance of the floriculture sector has been better in recent years.

A whole new crop of entrepreneurs and a host of big business houses are determined to find a fortune in flowers and are swarming like bees to the honey pot called the global market in floriculture. As the demands of cut rose floriculture is splendid in future, it is one of the imperative fields to endeavour.

### *Cost Estimation:*

Capacity	: 10000 Nos/ day
Plant and Machinery	: 16 Lakhs
Total capital Investment	: 177 Lakhs
Rate of return	: 45%
Break Even Point	: 35%

### **Jatropha Plantation**

With a rapidly growing economy and rising population, India is the fifth largest and one of the fastest growing petroleum oil consumers in the world. With limited domestic crude oil reserves, India meets over 72 per cent of its crude oil and petroleum products (diesel, aviation fuel, etc.) requirement through imports. Energy demand in the transport sector is growing relatively high due to the growing economy and rising private vehicle ownership, particularly four-wheelers. Due to rising oil consumption and relatively flat domestic production, India is increasingly dependent on imports to meet its petroleum demand. Thus the bio-diesel becomes an attractive proposition when oil prices are higher than the cost of vegetable oils as they can be used to directly replace petroleum derived products. Bio-fuels are renewable liquid fuels coming from biological raw material and have been proved to be good substitutes for oil in the transportation sector. As such bio-fuels, bio-ethanol and bio-diesel are gaining worldwide acceptance as a solution to environmental problems, energy security, reducing imports, rural employment and improving agricultural economy.

Ethanol is one such substitute that can be produced from Sugarcane, Sweet Sorghum and used in blend with gasoline for automobiles. Similarly, bio-diesel can be produced from oil bearing seeds of many plants grown in the wild like *Jatropha curcas*, *Pongamia*, *Neem*, *Mahua* and blended with High Speed Diesel for transport vehicles, generators, railway engines, irrigation pumps, etc. Large volumes of such oils can also substitute imported oil for making soap. Biodiesel commands crucial advantages such as technical feasibility of blending in any ratio with petroleum diesel fuel, use of existing storage facility and infrastructure, superiority from the environment and emission reduction angle, its capacity to provide energy security to remote and rural areas and employment generation. It is technically feasible as up to 20% of bio diesel is being blended successfully with diesel for some years in a number of countries.

India enjoys some special advantages in taking up plantation of tree-borne oil seeds for production of bio diesel as we have vast under-utilized or unutilized land, fallow, barren, degraded or under-stocked land, as in forests which are in drought prone areas. Additionally such trees can be grown along with normal crop cultivation. Bio-diesel is made from virgin or used vegetable oils (both edible & non-edible) and animal fats through transesterification and is a diesel substitute and requires very little or no engine modifications up to 20% blend and minor modification for higher percentage blends. *Jatropha* is a tough, drought-resistant plant that can grow in some of the harshest conditions. *Jatropha* can survive in the most arid wastelands and so vast barren swathes of India could be put to productive use. It is inedible so it would not cause a backlash by competing with food crops.

So this is the right moment for new entrepreneurs to venture into this field.

***Cost Estimation:***

Capacity	:	Cultivation Area 1000 Hectares Avg. Seed Production 4 MT/Hectares on 6 Year onwards
Plant & Machinery	:	158 Lakhs
Total Capital Investment	:	393 Lakhs
Rate of Return	:	48%
Break Even Point	:	44%

**Oil Palm Cultivation**

Oil Palm cultivation is rapidly expanding within the tropical zone and South-East Asia is the leading producer of palm oil. Palm oil comes from trees grown in tropical areas of the world. Rising global demand for edible oils, coupled with the crop's high yield, has turned palm oil into an economic juggernaut for Indonesia and Malaysia, which account for 85 percent of palm oil production, alone. Today more than 40 countries – led by China, India, and Europe - import crude palm oil. Palm oil has many health benefits, and is sustainable environmentally friendly oil. *Elaeis guineensis* or more commonly known as the palm tree has its roots in West Africa. The tree was growing wild in the region and later has been developed into an agriculture crop. Palm oil, a type of vegetable oil is used in a variety of foods including margarine, shortening, potato chips, cake mixes and even soap.

Oil palm cultivation is rapidly expanding within the tropical zone and South-East Asia is the leading producer of palm oil, accounting for more than 80% of the world's output. Palm oil, with a 20% market share, has emerged as one of the dominant vegetable oils, second only to soya bean oil. During the past three decades, the production of palm oil grew at the fastest rate (8% per year) compared to rape seed oil (7.2%), soya bean oil (4.5%), and sunflower oil (3.7%). Palm oil production is expected to increase further with the expansion of oil palm cultivation and improved cultivation techniques. The oil palm industry, with diverse products and by-products, offers two opportunities for the promotion of animal production. Firstly, the products and by-products from the industry are valuable feed resources with the potential to be utilized for expanding animal production. Secondly, the forages in the inter-rows can be consumed by ruminants. Integrating animal production with oil palm plantations should take into account all the available resources, i.e. the products and by-products of the industry as well as the forages grown in the inter-rows.

Demand for palm oil has increased in recent years due to its use as a biofuel, but recognition that this increases the environmental impact of cultivation

as well as causing a food vs. fuel issue has forced some developed nations to reconsider their policies on biofuel to improve standards and ensure sustainability. Purchasing sustainable palm oil can help stop the deforestation of the tropical rainforests. There are many companies working in partnership with local growers that are building communities, as well as protecting the environment.

Palm oil, which has more than doubled in the last decade, has rallied 57 percent this year on rising demand from India and China, the biggest user. Demand is expected to be quite strong especially from India. Palm oil accounts for 80 percent of India's total vegetable oil purchases.

There is a strong demand of palm oil in India at present and new entrepreneurs should venture into this field.

***Cost Estimation:***

Capacity	:	1000 MT Fresh Fruits Bunch/Annum After 3 year.
Plant & Machinery	:	24 Lakhs
Total Capital Investment	:	118 Lakhs
Rate of Return	:	53%
Break Even Point	:	41%

***Information***

- ★ One Lac / Lakh / Lakhs is equivalent to one hundred thousand (100,000)
- ★ One Crore is equivalent to Ten Million (10,000,000)
- ★ T.C.I. is Total Capital Investment
- ★ All costs/amount given in INR ₹
- ★ NPCS can provide customized Detailed Project Report on all the projects
- ★ Visit us at: [www.niir.org](http://www.niir.org) Email : [info@niir.org](mailto:info@niir.org)

### **Unsaturated Polyester Resin**

Unsaturated polyester resins are produced by the polycondensation of saturated and unsaturated dicarboxylic acids with glycols. Unsaturated polyester resins form highly durable structures and coatings when they are cross-linked with a vinylic reactive monomer, most commonly styrene. The properties of the cross-linked unsaturated polyester resins depend on the types of acids and glycols used and their relative proportions. Wall panels fabricated from polyester resins reinforced with fiberglass - so-called fiberglass reinforced plastic (FRP) - are typically used in restaurants, kitchens, restrooms and other areas that require washable low-maintenance wall.

### **Applications**

Uses & Applications of UPR are:

Polyester resins are used in sheet moulding compound, bulk moulding compound and the toner of laser printers.

- ★ Unsaturated Polyester Resin is thermosetting liquid viscous polymer mainly used in Glass Reinforced Plastics industry as a main raw material for FRP Products.
- ★ To manufacture polymeric insulators as material is electrically good insulator.
- ★ Pipes and poles and all kind of FRP sections, housing like domes, panel covers made of FRP and platforms for oil exploration activities and tanks.
- ★ find extensive use in the manufacture of corrosion resistant process equipment & storage tank, filament winding, pultruded & moulded articles; in cultured marble; architectural & construction products and in the automotive and transportation industry
- ★ Used as accessories and body parts like car bumpers and bus body etc.

### Global Scenario

Over the next 5 years, total unsaturated polyester resins consumption across the globe is expected to continue strong growth momentum at 6.3% CAGR. The unsaturated polyester resins market is expected to reach US \$ 5.8 billion by 2015. The demand for polymers - thermosets, alloys, blends and composites - was expected to rise to nearly 9.5 million TPA by the year 2011-12. The main consumer segments of polymers - buildings and construction, plasticulture, packaging, teletronics, transportation, domestic consumer goods - will all require increasing petro-chemical inputs. The expansion will not be limited to quantum; it will be supported also by technology upgradation and higher value addition. UPR market is expected to grow in near future because of new applications and demands. As wind energy and construction market have shown highest growth in last few years it is expected that, this growth will facilitate unsaturated polyester resins industry and it will continue the same performance and generate high revenue for the UPR manufacturer. In Western Europe, annual growth of 7-8% is forecast for unsaturated polyester resin consumption in this segment during 2007-2012. Growth will be higher in Asia.

Since there is a huge demand for unsaturated polyester resins in market therefore the entrepreneur venturing in this field expects an enormous success.

#### *Cost Estimation:*

Capacity	: 1000 Kg/day
Plant and Machinery	: 53 Lakhs
Total Capital Investment	: 228 Lakhs
Rate of return	: 41%
Break Even Point	: 42%

### PVC Flex Banner (Frontlit, Backlit & Vinyl)

PVC Flex is made out of PVC and Fabric raw material, specially designed for solvent printing industry. It is suitable for indoor and outdoor printing used in billboard, display, banners and exhibition booth decoration. PVC Flex is best to all digital printer specially designed for Indian market. Due to stable chemical character and excellent ink absorbency PVC flex will bring wonderful digital printing images for large format picture advertisements. In virtue of the high classic quality and best sales service, now a days, PVC flex is playing an important role in signage & banner advertizing industry. There are two types of PVC flex one is Frontlit flex and Backlit flex. This market is booming with 25-30% annual growth and is worth around Rs. 500-600 crore. This will consequently affect the Korean and Chinese markets in India, as our products would have an added advantage of local presence, moreover, quality standards are also no less, than any international brands, although Chinese flex has



above 90% market share in India and Korean flex with Just 5-7%, but now is set to launch its products to complete with quality standard.

There is a very good scope in this sector and new entrepreneurs should venture into this field.

***Cost Estimation:***

Capacity	:	PVC Flex Frontlit 340 gsm 2250000 Sq. MT/Annum PVC Flex Backlit (340gsm) 2250000 Sq. MT/Annum PVC Vinyl 120 gsm 720000 Sq. MT/Annum
Plant & Machinery	:	227 Lakhs
Cost of Project	:	417 Lakhs
Rate of Return	:	45%
Break Even Point	:	54%

**Expanded Polyurethane Foam**

Polyurethane is a polymer obtained by an exothermal reaction between Isocyanate (MDI diphenylmethane-diisocyanate or TDI toluendiisocynate) and polyol (polyether or polyester) one of the most desirable attributes of polyurethanes is their ability to be tuned into foam. Blowing agents such as water certain, halocarbons such as HFC-245fa (1, 1, 3, 3-pentafluoropropane) and HFC-134a (1, 1, 1, 2-tetrafluoroethane) and hydrocarbons such as n-pentane can be incorporated into the polyside or added as an auxiliary stream. Water reacts with the isocyanate to create carbon dioxide gas, which fills and expands cells created during the mixing process, polymer during the foaming process. They are used to emulsify the liquid components, regular cell size and stabilize the cell structure to prevent collapse and surface defects, rigid foam surfactants are designed to produce very fine cellos and very high closed cell content.

Surfactants are used to modify the characteristic of the polymer during the foaming process. They are used to emulsify the liquid components, regular cell size, and stabilize the cell structure of prevent collapse and surface defects. Rigid foam surfactants are designed to produce very fine cells and very high closed cell content. Flexible foam surfactants are designed to stabilize the reaction mass while at the same time maximizing open cell content to prevent the foam from shrinking. The need for surfactant can be affected by choice of isocyanate, polyol component compatibility, system reactivity, process condition and equipment, tooling, part shape, and shot weight.

Though the properties of the polyurethane are determined mainly by the choice of polyol the diisocyanate exerts some influenced by the functional group reactivity and the number of functional isocyanate groups. The

mechanical properties are influenced by the functionality and the molecular shape. The choice of diisocyanate also affects the stability of the polyurethane upon exposure to light.

Polyurethane's main characteristic versatility is the most versatile plastic material. Versatility as per physical mechanical characteristics of the polymer rigid, semi-rigid, flexible, solid, closed cell, open cell thermo-plastic, thermosetting etc. There are two different types of polyurethanes, expanded polyurethane and compact polyurethane.

There is a very wide scope and good market potential of products manufactured in this sector.

***Cost Estimation:***

Capacity	:	240000 Kg/Annum
Plant and Machinery	:	120 Lakhs
Cost of Project	:	263 Lakhs
Rate of Return	:	44%
Break Even Point	:	57%

**Plastic (HDPE) Water Storage Tanks**

The term Plastics usually refers to a large and varied group of synthetic materials which are solid in finished form but at some stage in their processing are fluid enough to be shaped by application of heat and pressure. The use of plastics in building has grown rapidly in the last few years. Plastics were first used for decorative and non structural purposes but because of increased knowledge of the long term properties of plastics particularly resistance to creep and environmental effects some plastics are now available that maintain long term structural integrity, such as piping, doors and windows, water tanks that can contain moderate pressures for a long period of time. During the last decade Plastic (conversion) Industry has progressed at a fast rate. New fields of application of plastics are continually being developed.

It is easier to cope with this diversity if plastics are considered to be a category of materials like metals embracing different distinct families in which each family, in turn is composed of many individual types. In spite of the diversity of plastics being great, in practice the choice for a given application will normally lie between a narrow band of plastic spectrum. Within this band there may be several plastics which approximate the desired requirements. Selection of the best one out of these requires weighing and comparing the properties of each. Among thermoplastic, L.D.P.E., L.L.D.P.E., H.D.P.E, P.V.C., Polyethylenes, Polypropylenes etc have entered market with large number of articles of multifarious uses.

Water Storage tanks are an attractive alternative to steel tanks. They do not corrode, they come in a variety of colors, and the majority has a very good warranty. However, these tanks are manufactured from petrochemicals derived from oil and are difficult to recycle or dispose of in a safe and ecological manner. Being constructed from such materials, a plastic is also highly vulnerable to damage from fire. Plastic tanks have only been in production for about 20 years, and as the effects of exposure to intense prolonged sunlight are known to break down the UV stabilizer, a plastic tank will inevitably fade in color and may collapse or split.

Big sizes tanks of plastics are manufactured by various methods patronized under molding. Large size water tanks syntax type are being made of plastic material by a unique process known as Rotational molding for making hollow parts especially applicable for making large or complex shapes usually from polyethelene. Plastic tanks are becoming very popular and are finding wider acceptability in every homes as well as industry.

HDPE water storage tanks are most reliable water tanks available today. These tanks are suitable for water storage purpose in residential to commercial properties. They have a significant life expectancy of 20 – 22 years (even used outdoor under hot tropical climate), in addition, they are non-toxic/food grade, rust & rot free, extremely durable & long lasting, sunlight (UV) & chemical resistant, seamless & odourless.

As regards plastic tanks in particular there are only very few manufacturers in India who manufacture H.D.P.E. syntax type tanks. Since these tanks are light in weight, non-corrosive in nature, high bursting strength and low initial cost it is replacing steel tanks, aluminium and wooden tanks. Consumption of plastic tanks is growing usually in housing, oil industries, chemical industries producing acids alkalies etc and in gas producing industries where it is filled up under high pressure.

As water supply tanks for domestic use it has found place in every modern home, flat, and building. Every houses built today has water storage tanks. Plastic tanks are the favored choice.

The consumption of water tanks (plastic) is linked with housing development. Thus there exists ever increasing demands for plastic water tanks commensurate with development of Housing both in Rural and Urban areas and in industries. There is a very good scope and market potential for this product and new entrepreneurs should venture into field.

#### *Cost Estimation:*

Capacity	:	90000 Nos./Annum Plastic (HDPE) Storage Tanks Storage Tank Cap. 1000 Ltrs.
Plant & Machinery	:	167 Lakhs
Total Capital Investment	:	1245 Lakhs
Rate of Return	:	49%
Break Even Point	:	28%

### **Polyvinylidene Fluoride**

Polyvinylidene fluoride is a specialty plastic material in the fluoropolymer family. It is used generally in applications requiring the highest purity, strength, and resistance to solvents, acids, bases and heat and low smoke generation during a fire event. Polyvinylidene fluoride is made up of 59% fluorine, 38% carbon and 3% hydrogen. The compatibility of the carbon and fluorine is such that it offers resistance to UV degradation and atmospheric chemical attack, which is far superior to the acrylic topcoat. PVDF is the material of choice when the porous structure will be exposed to ozone or chlorine. A fine powder grade is also used as the principal ingredient of high-end paints for metals. PVDF is known particularly for its creep resistance over a broad range of temperatures. It is widely used for gasketing and the lining of pipes and tanks. Its highly desirable solubility and electrical properties result from the polarity of alternating CH<sub>2</sub> and CF<sub>2</sub> groups on the polymer chain. PVDF tubing is ideal for fluid applications which require a high degree of purity such as the transfer of ultra-pure deionized water. Thinner walled PVDF tubing is translucent making it easier to confirm fluid movement. Thin wall PVDF tubing is also more flexible than FEP and PFA tubing but does not have as broad a working temperature range. If one needs a polymer that will withstand exposure to harsh thermal, chemical or ultraviolet conditions, PVDF offers superior stability similar to the performance of fluoropolymers in these environments. PVDF, an extremely hard material, may be used at temperatures from -80°F to 300°F (-62°C to 149°C). No oxidation or thermal degradation occurs during continuous exposure to 300°F (149°C). PVDF is a fluorocarbon and is classified as "Self Extinguishing, Group 1" by Underwriters' Laboratories, Inc. Thus it is used as good anti-corrosion material in chemical industry, especially in the circumstances of acid, organic solvents, halogens, as well as their mixture. Widely used as insulation material in electronic / electric industries, computer industry, air/space industry to make cable sheathing, coating layer, and condenser film, etc.

PVDF may be synthesized from the gaseous VDF monomer via a free radical (or controlled radical) polymerization process. This may be followed by processes such as melt casting, or processing from a solution (e.g. solution casting, spin coating, and film casting). At present, Vinylidene fluoride/ Polyvinylidene Fluoride resin is not produced in India. A number of Indian organisations who need to use PVDF in pumps, membranes, electronic parts either import the PVDF product itself or import PVDF sheet/powder for the production of PVDF product. PVDF sheets and rolls are imported in various thickness and sizes depending upon the requirement of individual organizations. The use of PVDF membrane is very selective in India and is imported. Indian demand for PVDF is much less than potential. There is a considerable efforts put forward to increase the demand for PVDF in India by setting up application laboratories and carrying out strong technical services oriented market campaign.

### **Rigid P.V.C. Film (For Pharma & Thermoforming Packaging)**

PVC is present in virtually all areas of human activity. PVC is a chlorinated hydrocarbon polymer. Its basic building blocks are chlorine, carbon and hydrogen. These elements are obtained from sea salt (sodium chloride) and crude oil or natural gas, both of which are mixtures of hydrocarbons. PVC is a thermoplastic. This means that it softens upon heating and hardens upon cooling.

These days, it is PVC the second most popular plastic in the world. In more than 60 years of production and commercial use, PVC has contributed greatly to the development of modern life. It has also become one of the most thoroughly researched materials. Its manufacture is closely regulated and results of life cycle analyses published so far show that PVC is a safe product in its production, use and disposal.

PVC film made by extrusion blown process is widely used for packaging purposes. PVC packaging film has given a new dimension to the world of packaging. These films for packaging form the biggest market for PVC. The heat-shrinkable characteristic is fully utilized to serve diverse covering and packaging needs, such as anti-corrosion, electrical insulation and external decoration requirements. The easy coloring and printing receptiveness of this film boosts the visual attractiveness of any product. The calendared process for the manufacture of PVC films is highly developed in India that today it is possible to obtain thin films of excellent quality without it. The PVC films manufactured using the calendared process is of thickness ranging below 0.1mm. It is a versatile packaging medium both for pharma and food industry. PVC may be manufactured to be either rigid or flexible. Rigid PVC is used to make construction materials such as home siding and pipes, packaging etc. More than 70 percent of all the PVC made are used in construction & packaging.

Packaging is among the high growth industries in the recent years. A high degree of potential exists for almost all user segments which are expanding appreciably; processed foods, hard and soft drinks, fruit and marine products, drugs and pharmaceuticals, soaps and toiletries, cosmetics and personal care, office stationery and accessories, fabrics and garments, white goods and other durables, electrical appliances and equipments, entertainment and other electronics, shoes and leather ware, gems and jewellery, toys and sports goods, chemicals and fertilizers.

There is a very good scope in this segment. New entrepreneurs should venture into this field.

#### ***Cost Estimation:***

Capacity	:	5000 MT/Annum
Plant & Machinery	:	1040 Lakhs
Cost of Project	:	1411 Lakhs
Rate of Return	:	44%
Break Even Point	:	41%

### **Biodegradable Plastic Products (Bags, Plates & Glasses)**

Plastics have become an important part of modern life and are being used in different sectors like packaging industry, building materials, consumer products etc. Most of today's plastics and synthetic polymers are produced from petrochemicals. As conventional plastics are persistent in the environment, improperly disposed plastic materials are a significant source of environmental pollution, potentially harming life.

The biodegradable polymers could be an alternative to the conventional plastic materials. The term biodegradable means that a substance is able to be broken down into simpler substances by the activities of living organisms, and therefore is unlikely to persist in the environment. There are many different standards used to measure biodegradability, with each country having its own. The requirements range from 90 per cent to 60 per cent decomposition of the product within 60 to 180 days of being placed in a standard composting environment.

Biodegradable plastics are mainly derived from corn, wheat and potato starch. Biodegradable plastics products are thermoplastic materials which are processed with the same machines traditionally used to process conventional plastics. Biodegradable plastic products physical and chemical properties are similar to those of traditional plastics, but it is completely biodegradable in different environments, just like pure cellulose. The advantages of biodegradable plastics can prevent plastic pollution from becoming worse, and other methods can be used to help clean up any of this pollution that is already present. Waste to energy programs, and other alternative uses for traditional plastics that are cluttering up landfills and other areas, can eliminate the plastic garbage build up that harms the earth and environment.

India consumes around five million tons (mt) of plastic products every year. Of this, a large amount of consumption happens through use of plastic bags alone. The country doesn't have a national ban on use of plastic bags. However, on their own, several states such as Punjab, Goa, Himachal Pradesh, Jammu & Kashmir, Kerala, Maharashtra, Sikkim and West Bengal have imposed a ban on plastic bags. Rajasthan, the largest state of India joined this green league in July.

In recent years, more and more attention as the green packaging and also for the promotion of environmental protection considerations began to encourage the production of biodegradable plastic packaging.

Biodegradable materials by nature rely on the role of microbial decomposition, as packaging materials can significantly reduce the amount of garbage. With good quality of products, about 41% of biodegradable packaging is used for food preservation. 90 years since the 20th century,



the global production of biodegradable plastics rapid increase, of which around 60% used in the packaging industry.

There is a very good scope and future for this product and new entrepreneurs should venture into this field.

***Cost Estimation:***

Capacity	:	28125000 Nos./Annum Glass 15000000 Nos./Annum Plates 12857000 Nos./Annum Bags
Plant & Machinery	:	145 Lakhs
Cost of Project	:	258 Lakhs
Rate of Return	:	44%
Break Even Point	:	49%

**PVC Compounds from PVC Resin**

Polymers have found uses in all spheres of life with demand for better materials, greater functional utility, more economical packaging and versatile and durable all-weather products. PVC is a chlorinated hydrocarbon and is a thermoplastic material. Thermoplastic materials are those that can be melted again and again. These materials can be heated to a certain temperature and will harden again as they cool. Its long life excellent resistance to chemicals, its self extinguishing resistance to chemicals, its self extinguishing and electrical properties and availability in a wide range of colours give it an edge over other plastic materials.

P.V.C. is of special interest of developing countries like India as it is used in the building industry. It is a substitute for iron and steel and non ferrous metal and replaced lead and aluminium. It is also a supplementary material for goods of bulk consumption such as leather and rubber and for electrical insulation paper glass for containers wood for lamination paneling and asbestos. Nowadays, PVC is commonly used in the construction sector, for example in window frames and shutters, pipe cabling and coating, etc. PVC can be used for tons of other applications from industrial ware and widely used in the healthcare sector, to car spare parts, toys factory, food packaging, raingear, etc. There exist different PVC grades such as coast or blow film, high impact, wire and cable grade, thermoforming, injection molding, rotational molding, etc.

PVC is one of the world's most widely used polymers because of its versatility, excellent inherent properties and cost effectiveness, and yet its sensitivity to the processes used to convert it into end products make it a challenge for any PVC compound producer. Developing tailored grades of PVC compound to suit specific performance requirements calls for a wealth of formulation knowledge, technical experience and an in-depth understanding of processing. Success in the laboratory has to transfer not only to the

process but also to the individual equipment on which the compound is converted into usable product.

The Indian industry has created enough capacity to export polymers in substantial quantities. With the steady build-up of capacities, the downstream products industry is increasingly accessing local supplies. The supplies have expanded from IPCL's Nagothane plant, Reliance's Hazira plant, Finolex's Raigad plant, and South Asia's PET project at Haldia. With the start-up of Reliance's polypropylene plant, the position changed further. India has over 22,000 processing units with a turnover of about USD 6 bn. The plastics machinery industry supplies more than 3000 machines per annum to the industry.

India is one of the fastest growing polymer market in the world, and is expected to become the world's third largest polymers market, with a consumption of 12.5 mn tonne, after the US and China, in 2010. The significant domestic demand growth is expected from the user industries such as telecom, food and beverages, packaging, transportation and consumer durables, and from continued substitution of traditional materials like wood, metal, glass.

There exists a very good opportunity and ample scope to venture into this field for new entrepreneurs.

#### *Cost Estimation:*

Capacity	:	3000 MT/Annum
Plant & Machinery	:	129 Lakhs
Total Capital Investment	:	675 Lakhs
Rate of Return	:	45%
Break Even Point	:	32%

#### **Bio Plastic Products**

Plastics have become an important part of modern life and are used in different sectors of applications like packaging, building materials, consumer products and much more. Plastic packaging is proving to be a major environmental problem. Most of today's plastics and synthetic polymers are produced from petrochemicals. As conventional plastics are persistent in the environment, improperly disposed plastic materials are a significant source of environmental pollution, potentially harming life. The plastic sheets or bags do not allow water and air to go into earth which causes reduction in fertility status of soil, preventing degradation of other normal substances, depletion of underground water source and danger to animal life. In the seas too, plastic rubbish - from ropes and nets to the plastic bands from beer packs -choke and entangle the marine mammals.

In an effort to overcome these shortcomings, biochemical researchers and engineers have long been seeking to develop biodegradable plastics that

are made from renewable resources, such as plants. The biodegradable polymers could be an alternative to the conventional plastic materials. The term biodegradable means that a substance is able to be broken down into simpler substances by the activities of living organisms, and therefore is unlikely to persist in the environment. There are many different standards used to measure biodegradability, with each country having its own. The requirements range from 90 per cent to 60 per cent decomposition of the product within 60 to 180 days of being placed in a standard composting environment.

Biodegradable plastics or bioplastics are mainly derived from corn, wheat and potato starch. Biodegradable plastics products are thermoplastic materials which are processed with the same machines traditionally used to process conventional plastics. Biodegradable plastic products physical and chemical properties are similar to those of traditional plastics, but it is completely biodegradable in different environments, just like pure cellulose.

The demand for bioplastics makes it one of the fastest growing thermoplastic product types globally. Global demand is expected to reach over one billion pounds by 2012. Currently, the biodegradable segment of bioplastics is the largest segment of the bioplastics category, but it is projected to be displaced by the non biodegradable bioplastics group of products, which may or may not be 100% derived from biomass. Packaging, disposable food service and fiber applications are major use areas. Polylactic acid polymer (PLA) demand is growing rapidly in both packaging and fiber applications. Demand for starch based polymers, in a modified form or blended with another polymer such as PLA for biodegradability or with a polyolefin such as polypropylene, will continue to grow.

Disposable cutlery and containers are products that are a part of our day to day life. Disposable items like bags, cups, plates, saucers, glasses are being increasingly used. Biodegradable bags are becoming more and more commonly used, because they are better for the environment and most people are concerned about being more "green".

Though the demand for biodegradable plastics is increasing, acceptance of biodegradable polymers is likely to depend on factors like:

- Customer response to costs;
- Possible legislation by governments; and
- The achievement of total biodegradability

Substantial technological progress has been made in bio-based plastics in the past five years. Innovations in material and product development, environmental benefits as well as the gradual depletion of crude oil increasingly call for polymers made from renewable raw materials.

Bioplastics will raise more than fourfold to 900,000 metric tons in 2013, valued at US\$2.6 bln, according to a report by The Freedonia Group. The

growth will be fueled by a number of factors, including consumer demand for more environmentally-sustainable products, the development of bio-based feedstocks for commodity plastic resins and increasing restrictions on the use of non-degradable plastic products, particularly plastic bags. Most important, however, will be the expected continuation of high crude oil and natural gas prices, which will allow bioplastics to become more cost-competitive with petroleum-based resins. Non-biodegradable plant-based plastics will be the primary driver of bioplastics demand.

Biodegradable plastics, such as starch-based resins, polylactic acid (PLA) and degradable polyesters, accounted for the vast majority (nearly 90%) of bioplastics demand. Double-digit gains are expected to continue going forward, fueled in part by the emergence on the commercial market of polyhydroxy-alkanoates (PHAs). PLA will also see strong advances in demand as new production capacity comes online. Western Europe was the largest regional market for bioplastics, accounting for about 40% of world demand. Bioplastics sales in the region benefit from strong consumer demand for biodegradable and plant-based products, a regulatory environment that favors bioplastics over petroleum resins, and an extensive infrastructure for composting. Demand will grow more rapidly in the Asia/Pacific region, which will surpass the West European market by 2013. Gains will be stimulated by strong demand in Japan, which has focused intently on the replacement of petroleum-based plastics. Europe is leading the way for induction of bioplastics in day to day use. Companies such as Novamont SpA, NatureWorks LLC, and Metabolix, Inc. are entering the market with new bio-based products. Demand for bioplastics is accelerating as more supply of all bioplastic types come into production. Though this product is now at a nascent stage in India but in the long run this product has a very promising future. New entrepreneurs should venture into this field.

#### *Cost Estimation:*

Capacity	:	15000000Nos. (Bio Plastic Glasses) 1000000 Nos. (Bio Plastic Plates) 75000 Nos. (Bio Plastic Bags)
Plant & Machinery	:	166 Lakhs
Cost of Project	:	298 Lakhs
Rate of Return	:	47%
Break Even Point	:	51%

#### **PVC Doors**

A door is a movable structure used to close off an entrance, typically consisting of a panel that swings on hinges or that slides or rotates inside of a space. When open, they admit ventilation and light. The door is used to control the physical atmosphere within a space by enclosing the air drafts, so that interiors

may be more effectively heated or cooled. Doors are significant in preventing the spread of fire. They also act as a barrier to noise.

They are also used to screen areas of a building for aesthetics, keeping formal and utility areas separate. Doors also have an aesthetic role in creating an impression of what lies beyond. Doors are often symbolically endowed with ritual purposes, and the guarding or receiving of the keys to a door, or being granted access to a door can have special significance. Similarly, doors and doorways frequently appear in metaphorical or allegorical situations, literature and the arts, often as a portent of change.

Architectural doors have numerous general and specialized uses. Doors are generally used to separate interior spaces (rooms, closets, etc.) for privacy, convenience, security, and safety reasons. Doors are also used to secure passages into a building from the exterior for reasons of safety and climate control. PVC doors are waterproof and do not expand, contract or warp when they come in touch with water. They are termite proof and no termites or other insects can harm the product unlike other traditional material, which disintegrate when termite or insects attack it. They are also fire retardant and easy to maintain and install. PVC doors have anti fungal properties with excellent weather ability, durability and above all eco-friendly.

The Indian construction industry, an integral part of the economy and a conduit for a substantial part of its development investment, is poised for growth on account of industrialization, urbanization, economic development and people's rising expectations for improved quality of living in the coming years.

There is a very good scope and market potential for new entrepreneurs to venture into this field.

***Cost Estimation:***

Capacity	: 100000 Nos./Annum (PVC Doors)
Plant & Machinery	: 283 Lakhs
Total Capital Investment	: 1557 Lakhs
Rate of Return	: 45%
Break Even Point	: 48%

**PVC Water Storage Tanks**

Proper storage of water is essential for various uses like bathing, cleaning, drinking, cooking etc. Water tanks are used to ensure safe and clean water for various purposes. So it becomes necessary to construct the tank in a way that maintains the purity and hygiene of water. Plastic water storage tanks are lighter and more portable; they are great space savers and cost less than their steel or wood counterparts. These tanks are an attractive alternative to steel tanks. They do not corrode, they come in a variety of

colors, and the majority has a very good warranty. However, these tanks are manufactured from petrochemicals derived from oil and are difficult to recycle or dispose of in a safe and ecological manner. Being constructed from such materials, a plastic is also highly vulnerable to damage from fire. Plastic tanks have only been in production for about 20 years, and as the effects of exposure to intense prolonged sunlight are known to break down the UV stabilizer, a plastic tank will inevitably fade in color and may collapse or split. Tanks should have a fully self-supporting roof. Some tank manufacturers have a pole or frame in their larger tanks to hold up the roof. These poles sometimes push through the top of the tank or even the bottom and allow mice and rats to get into the tank.

Polyvinylchloride (PVC) has a linear structure similar to polyethylene but with a chlorine atom replacing a hydrogen atom on alternate carbon atoms. PVC itself is hard and rigid but the addition of phthalate esters as plasticizers makes it soft and pliable. Thus hygiene is an essential component of healthy living, integral to achieving health and preventing disease and Plastic water tanks provides an excellent way to store water.

This product has a very long life and good scope in the market. New entrepreneurs should venture into this field.

***Cost Estimation:***

Capacity	:	50000 Nos./Annum PVC Storage Tanks Storage Tank Cap. 1000 Ltrs.
Plant & Machinery	:	350 Lakhs
Total Capital Investment	:	1389 Lakhs
Rate of Return	:	48%
Break Even Point	:	40%

**Acrylic Resin (Emulsion Type)**

Resin is a natural or synthetic compound which begins in a highly viscous state and hardens with treatment typically; resin is soluble in alcohol, but not in composition and potential uses. There are numerous applications for resin, ranging from art to polymer production, and many consumers interact with product, which contain resin on daily basis.

Humans have been using natural resins for thousand of years. Pine pitch has been used to seal boats, mummies, food containers and an assortment of other things. It has also been used as component in varnish, lacquer, inks, perfumes jewellery and many other objects. With human technological advances came the realization that resins could be formulated into polymers and discovery of synthetic resins followed shortly after.



For most part, polymers made with "resins" are actually made with synthetic resin which is cheaper and easier to refine. Synthetic resin is much more stable, predictable and uniform than natural resin as well, since it is made under controlled condition without the possibility of the introduction of impurities. These resins are made by combining chemicals in a laboratory to stimulate the reaction which results in formulation of a resinous compound. The resin can be used in production of plastic, paints and many of the some substances that natural resin is used in. The demand of alkyd resin is increasing rapidly, so there is wide scope for new entrepreneurs.

The Acrylics are a group of thermoplastic resins formed by polymerization of esters or amides of acrylic acid. Now-a-days they are being used as adhesives. They offer a wide range of bonding materials as well as adhesives and coatings. They have good resistance to weathering and good textile strength. These are multifaceted polymers that are utilized in variety of applications and in many forms: emulsion, solvent solution, 100% reactive, radiation cured and films. In the last dozen years, consumption of acrylic adhesives jumped 175%.

There is a very good scope in this field. New Entrepreneurs venturing in this field will find immense market potential.

***Cost Estimation:***

Capacity	:	1500 MT/Annum
Plant & Machinery	:	46 Lakhs
Cost of Project	:	176 Lakhs
Rate of Return	:	43%
Break Even Point	:	62%

**Coating of Titanium Dioxide on Plastic Surfaces**

Plastics are used in virtually all sectors of industry, from the manufacture of mobile phones to automotive engineering. Most plastics are now coated for protection against weathering, attack by solvents and scratching, as well as for decorative reasons.

Surface coating of plastic is defined as the process of applying coatings to plastic surface parts to improve the appearance of the surface, to protect the surface from physical or chemical stress, and or to attenuate electromagnetic interference or radio frequency interference that would otherwise pass through plastic housings. Plastic are synthetic polymers formed into panels, housings, bases, covers, or other business machine components. The business machines category includes items such as typewriters, electronic computing devices, calculating and accounting machines, telephone and telegraph equipment, photocopiers, and miscellaneous office machines.

Surfaces in general are contaminated by dust, smoke, exhaust gas, organics, bacteria, mold, ultraviolet degradation etc. Various solutions have been proposed to address such surfaces contamination problems.

Surface coating techniques using nanoproducts are rapidly advancing globally. Nanotechnology can deliver micro coatings onto surfaces exhibiting different properties.

Nanotechnology is attracting a lot of attention from governments, academia and industry. A nanometer is a million times smaller than a millimeter and 10,000 times smaller than anything the human eye can see. Nanoparticles offer huge amounts of surface area. As the object size gets smaller, the surface area to volume ratio becomes larger. Nanoparticles surfaces act as excellent catalyst sites and less amount of material is needed for producing the same effect thus leading to high efficiency, less toxicity, less weight, and/or less costs.

The particle size of nano titanium dioxide manufactured worldwide varies from 20 to 50 nanometers. The individual particles are not visible to naked eye, while agglomerates of particles are visible. At the same time, pigmentary titanium dioxide has particle size in the range of 250 and 350 nanometers

The pigmentary titanium dioxide absorbs ultra-violet light and reflects visible light, while the nano particles not only reflects visible light, but effectively transmit visible wave length through the crystals. The nano titanium dioxide was especially useful for automotive coatings when used with pigments like aluminium flakes, which is the most widely used pigment in automobile industry for imparting a metallic look to coatings and also as antimicrobial coatings on plastic surfaces.

Nanotechnology and nonmaterial for the industry are at a beginning stage in India but in developed countries this is not a new concept. There is an immense scope and potential in this field. New entrepreneurs should explore and venture into this field.

#### *Cost Estimation:*

Capacity	:	234 Thousand Sq. MT/Annum
Plant & Machinery	:	60 Lakhs
Cost of Project	:	161 Lakhs
Rate of Return	:	41%
Break Even Point	:	63%

#### **PET Bottle from PET Resin**

PET - *polyethylene terephthalate* is a form of polyester or resin, clear and lightweight, non-reactive, economical, and shatterproof plastic used around the world as an excellent energy-efficient packaging material. It is extruded

or molded into plastic bottles and containers for packaging foods and beverages, personal care products, and many other consumer products. PET is the most recycled plastic worldwide. PET bottles/containers are popular for packaging sodas, water, juices, salad dressings, cooking oil, peanut butter, shampoo, liquid hand soap, mouthwash, pharmaceuticals, even tennis balls. Virtually all single-serving and 2-liter bottles of carbonated soft drinks and water sold in the U.S. are made from PET. Special grades of PET are used for carry-home prepared food containers that can be warmed in the oven or microwave. PET is a polymer of ethylene glycol and terephthalic acid. Pellets of the PET resin are heated to a molten liquid, which can be easily extruded or molded into almost any shape.

#### **Properties of PET**

- ★ Very low moisture absorption
- ★ Excellent dimensional stability
- ★ High deflection temperature under load
- ★ Continuous working temperature up to 140°C
- ★ Very high mechanical strength & stiffness
- ★ Good wear & tear resistance
- ★ Excellent electrical resistance & dielectric strength
- ★ Good resistance to chemicals, petrol, oil fats

#### **Uses and Applications**

PET is hygienic, strong, and resistant to attack by micro-organisms, does not react with foods or beverages, and will not biologically degrade. Its safety for food and beverage use is recognized by health authorities around the world. But unlike glass, PET is extremely lightweight, simple to transport and won't break, which is why it is preferred for packaging many foods and beverages. PET, which is becoming increasingly popular, the size of the container produced ranges from 500 ml to 10000 liters. It is used for 1.5 litres thermally stable fruit juice bottle. In food and confectionery, filling liquors and wine, it can be used for pharmaceuticals and agrochemicals, it can be used for cosmetics. Some of the applications of PET bottles are:

- ★ Packaging Industry (Used for packing food stuffs, liquor, pharmaceuticals, pesticides etc.)
- ★ Electrical & electronic industry (capacitor fans, key tops for business machines, connectors, optical fiber, electrical iron components, head lamp reflectors, instruments housings, sockets, relays, plugs)

- ★ Irrigation (Sprinkler, nozzle for drip irrigation system, elbow joints, joints for hydraulic lines)
- ★ Domestic application (toothpaste tube shoulder, door handle, bath fittings)
- ★ Recreation, sports & games items
- ★ Building construction & furniture

PET has been approved as safe for contact with foodstuffs and beverages by the FDA, Health Canada, the European Food Safety Authority and virtually every other health-safety agency in the world.

### Market Survey

The global demand for PET was growing fast over the last decade. The effect of the economic slowdown has adversely affected the consumption of various commodities in many countries globally. Hence, demand for PET has also slowed down over the past two years. The global PET market in 2009 was 15.3 million tons. As the economies recover from the slowdown, the consumption of commodities will rise again and the global demand for PET will grow at CAGR of 4.9% up to 2020. PET packaging has been doing very well as it offers the flexibilities of innovation, both in terms of pack design and size. Pepsi expects 15% reduction in the share of glass bottles from 65%. Likewise Coca-Cola India is not far behind in lapping up the growth in the PET model. India produces around 500,000 tons of PET annually. The overall capacity of the industry is rated at about 650,000 tons per year. The application of PET resin for packaging is expected to grow in the coming years. Products like ketchup, beer and juices will be packed in PET made possible by hot fill and multilayer technology.

### *Cost Estimation:*

Capacity	:	12000000 Nos./Annum
		Size: 0.5, 1, 2 Ltrs Capacity
Plant and Machinery	:	82 Lakhs
Cost of project	:	231 Lakhs
Rate of return	:	43%
Break Even Point	:	51%

### Blow Moulded Containers (HM, HDPE)

This is the most common method of blow moulding. There are two possible methods, which may be used-intermittent extrusion or continuous extrusion. For extrusion blow moulding materials having high hot strength and hot elongation are preferred. It is used to produce extruded and moulded

mechanical goods & H.D.P.E. blow moulded products obtained 1.9 million tons/annum throughout the world. In India there is 8% of the plastic products are blow moulded. As a whole blow moulded specially modified H.D.P.E. container has good demand. Any new entrepreneur may get good market and will be successful if venture in to this field.

***Cost Estimation:***

Plant Capacity	:	2000.00 No.'s/Day
Plant & Machinery	:	128 Lakh
Total Capital Investment	:	547 Lakh
Rate of Return	:	49%
Break Even Point	:	31%

***Information***

- ★ One Lac / Lakh / Lakhs is equivalent to one hundred thousand (100,000)
- ★ One Crore is equivalent to Ten Million (10,000,000)
- ★ T.C.I. is Total Capital Investment
- ★ All costs/amount given in INR ₹
- ★ NPCS can provide customized Detailed Project Report on all the projects
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## Chapter 54

## POTATO PROCESSING AND POTATO BASED PRODUCTS

### Modified Potato Starch

Potato starch is starch extracted from potatoes. The cells of the root tubers of the potato plant contain starch grains (leucoplasts). To extract the starch, the potatoes are crushed; the starch grains are released from the destroyed cells. The starch is then washed out and dried to powder. Potato starch is essential as a universal binding and food thickening agent. Leveraging on potato starch production and producing modified potato starch that is specially customized for various applications in food, textile and paper manufacturing industries.

### Applications

Starch and modified starches have a broad range of applications both in the food and non food sectors. The largest users of starch in the EU (30%) are the paper, cardboard and corrugating industries. Other important fields of starch application are textiles, cosmetics, pharmaceuticals, construction and paints. In the medium and long run starch will play an increasing role in the field of "renewable raw materials" for the production of biodegradable plastics, packaging material and moulds. The powder has very consistent as the major raw materials are available in house with very good quality. The best value provided by the modified starch over native starch is the reduction in downtime and improvement in paper quality. Additional benefits offered by the modified starches are improvement in wastewater discharge quality with charged starches, elimination of chemical and equipment for onsite conversion of native starches, reduction in labour costs due to the simplicity of cooking and using modified starches etc.

### Global Demand

Starch, one of the most present biomaterials has witnessed significant developments over the years. After witnessing a temporary dip in growth in the year 2008 and 2009, the world market for starch, by consumption is expected to recover and register healthy growth to reach 80 million metric



ton by 2015. The Global starch market is likely to get respite from deceleration in its market growth, with growth poised to receive a new lease of life in the next few years, thanks to the growing consumption of liquid starches and modified starches. The modified starch market is projected to be the fastest growing segment over the period 2007-2015. The US represents the largest geographic market for starch, having accounted for a share of about 51% in the total volume of starch consumed in 2009. Given the country's large per capita income, the demand for starch in the US has been steadily on the rise. Asia Pacific represents the fastest growing market over the period 2007-2015. Growing employment opportunities, and subsequent increase in per capita income over the last few years, particularly in China and India, have been driving the growing demand for starch in the region.

The demand of the product in the market is immense and therefore its market position is splendid. Hence it is an excellent field to venture.

***Cost Estimation:***

Capacity	: 45000 MT/Annum
Plant and Machinery	: 554 Lakhs
Cost of the project	: 1618 Lakhs
Rate of return	: 43%
BEP	: 50%

**Potato Powder, Flakes**

India vegetable basket is incomplete without mentioning the king of vegetables-potato-a sustaining force and a culinary delight. The power of potato is known for sustaining millions of lives by providing food and nutrition during distress times. Its high production potential per unit area high nutritional value and great taste makes potato one of the most important food crops in the world classified as a vegetable, potatoes help contribute to the minimum goal of eating five serving of fruits and vegetables per day. One serving a 5.3 ounce, medium potato provides 45 percent of the daily value for vitamin c three grams of fiber, only 100 calories etc.

Potato powder and flakes are processed potatoes. It will help to increase the shelf life of potatoes. There are various machines required for the processing of potatoes most of the machines are indigenously available; very few of them may be imported.

Potato flake is crispy and very lightweight product. It also absorb moistures from air and become soft. It is used as breakfast or snack food. Potato powder is used for making *aloo bhujia*, it is used to make soup concentrate since potato is perishable commodity it needs to be stored at proper temperature. However storage facilities are sufficient only for one third of the produce. There are many cold storage at present in India. Moreover, while

in transportation, sizable quantities are destroyed approximately 10% of potato production is used as seed.

The demand for potato chips and wafers will not show much increase as it is a convention food. Its demand is likely to increase at 5 percent per annum. The demand for flakes and granule is likely to show a higher growth rate in the coming years. Flakes and granules are used in fried namkeen, extruded product, soap powders, prepared meals, baby food industry etc. The productions of flakes increase likely to increase export demand at the rate of 8 percent per annum in next few year.

The production of potatoes is quite high in India. The national average yield is expected to 24.54 tonnes/hectare by the year 2020 and production is likely to reach 49 million tonnes by 2020.

There exists a very good opportunity and scope to venture into this field for new entrepreneurs.

#### ***Cost Estimation:***

Capacity	:	1800 MT/Annum 5 MT Potato Powder/Day and 1 MT Potato Flakes/Day
Plant and Machinery	:	133 Lakhs
Total Capital Investment	:	513 Lakhs
Rate of Return	:	41%
Break Even Point	:	43%

#### **Potato Flakes**

India is one of the leading potatoes producing country. Potatoes produced in states are suitable for value added processing like manufacturing of potato flakes and powder. Potato powder/flakes have wide application in the processed and snack food industries, it can be used in any recipe which requires mashed potatoes. Potato flakes/powder is used in bread, pancake and waffle recipes or as a thickener for smoother sauces, gravies and soups. Also used in fabricated potato chips, extruded snacks, snack pellets, battered breaded products etc. It is also used in gluten-free and allergy cooking. Potato flakes/powder is increasingly being used in a variety of food preparations like snack foods (mc Donald, Pringle, Haldiram Namkeens etc.), soups, ready to eat vegetable curries and other dishes as a thickening agent and stir fries. It has strong potato flavour. It can be a binding material for preparing kheer, tikki, chops, pakoda, cutlets, stuffed paratha, kofta and other products. Its use at present is mainly in hotels, restaurants, but acceptance in household is growing due to its inclusion in items like ready to cook soups, dal, curries, etc. It gives added flavours to curries. It can be used in gulab jamun, puri and paratha.

India is one of the largest producers of potato and ranks third contributing around 7.5% to the world's production. Potato is probably the most popular food item in the Indian diet and is a highly nutritive food. India's potato production has seen a phenomenal increase since the 1950s, mainly due to strong demand from the processing industry and remunerative returns. According to the Central Potato Research Institute (CPRI), the area under potato rose by almost 547% since the 50s, while yield rose by 267% and overall output jumped by 146%.

The potato flakes is supplied in bulk to the manufacturers of the various snack food items and restaurants/ hotels. The major demand is in cities like Mumbai, Delhi, Chennai, Nagpur, etc. The demand is much more than the supply at present and is likely to grow with the increasing popularity of the snack foods and other items where potato powder is used as input. It has good export potential also, and European countries are largest consumer of potato flakes/flour.

According to a study by McKinney & Co, the Indian food market will grow two fold by 2025 with the rapidly growing Indian economy and improving lifestyles of Indians contributing in a big way to this growth. The market size for the food consumption category in India is expected to grow from US\$ 155 billion in 2005 to US\$ 344 billion in 2025 at a compound annual growth rate of 4.1 per cent according to market survey. With a growing population and rising per capita income with different lifestyles consumers are willing to pay a premium for both value-added private and branded products, creating immense opportunities for manufacturers and retailers in this sector. There is a very good scope and market potential for potato flakes and new entrepreneurs should venture into this field.

***Cost Estimation:***

Capacity	: 2160 MT/Annum
Plant & Machinery	: 664 Lakhs
Cost of Project	: 951 Lakhs
Rate of Return	: 43%
Break Even Point	: 42%

**Potato Powder (Automatic Plant)**

Potato is one of the important tuber vegetables, which is consumed throughout the year. Its Botanical name is *Solanum Tuberosum*. Potatoes can be consumed in varied forms. In fact, it is a vegetable that can easily be combined with any other food item including other vegetables, cereals, pulses, meat and poultry.

The raw materials required for potato powder are fresh potatoes. The forms of its products are single cells or cell aggregates, so we call it potato

granules/powder. Potato powder is a highly concentrated and nutritious flour ground from the pulp of cooked potato. The potato powder is used as thickening agent in soups and stems, for breading meat and fish. It is used extensively by the armed forces, the civilian trade and the school lunch programme.

The main difference between potato powder and potato starch, is potato powder is the dehydrations of fresh potatoes, they contain all dry matter of potatoes in addition to potato skin. Due to maintain the integrity of potato cell granules as much as possible, potato powder after watering have the nutrition, flavour and taste of cooked potatoes. Potato starch is only one of many ingredients of potato, so potato starch does not have the nutrition, flavour and taste of potatoes.

Potato powder contain not only as the same nutrition level as cereal flour, but also rich in vitamin C and a lot of K. Potato powder contain large amounts of dietary fibre and lower fat. Do not contain cholesterol and saturated fatty acid, are convenient to eat and easy to digest and absorb, so they are particularly suitable for elderly and children to eat. Re-mixed potato powder strengthened nutrition is the full price of nutritious food accepted by the world.

Potato powder has kept the original flavour of potatoes as much as possible. 70%-80% of lasting leisure small foods and approximately 30% of convenient foods are potato products, this shows that consumers prefer for the potato flavour.

India is one of the major potato producing countries in the world. Almost all states of our country are producing this crop widely. The potato powder is meant only for export. More than 70% of the total indigenous production of potato powder is exported to various countries. Domestic market for dehydrated and powdered potato also exists. The potato dehydration and powder-manufacturing unit has exclusively been reserved on small scale by the Government of India, as per the industrial policy.

This product has a very good scope and market potential, new entrepreneurs should venture into this sector.

#### ***Cost Estimation:***

Capacity	:	4 MT/Day
Plant & Machinery	:	204 Lakhs
Total Capital Investment	:	478 Lakhs
Rate of Return	:	37%
Break Even Point	:	46%

#### **Potato Powder, Granules & Flakes**

Potato is one of the important tuber vegetables, which is consumed throughout the year. Indian vegetable basket is incomplete without mentioning the king of vegetables-potato-a sustaining force and a culinary delight. The tantalizing

taste of nutrient-rich potatoes makes it an essential part of every breakfast, lunch and dinner worldwide. Potatoes can be consumed in varied forms. In fact, it is a vegetable that can easily be combined with any other food item including other vegetables, cereals, pulses, meat and poultry. Potato can be used to produce many value-added products. It can be roasted, boiled, fried, baked or steamed.

The raw materials required are fresh potatoes. The forms of its products are single cell or cell aggregates, so we call it potato granules/powder and flakes.

The main difference between potato powder and potato starch is that potato powder is the dehydration of fresh potatoes; they contain all dry matter of potatoes in addition to potato skin. To maintain the integrity of potato cell granules as much as possible, potato powder after watering have the nutrition, flavour and taste of cooked potatoes. Potato starch is only one of many ingredients of potato, so potato starch does not have the nutrition, flavour and taste of potatoes. Potato powder contain not only as the same nutrition level as cereal flour, but also rich in vitamin C and a lot of K. Potato powder contain large amounts of dietary fibre and lower fat. Do not contain cholesterol and saturated fatty acid, are convenient to eat and easy to digest and absorb, so they are particularly suitable for elderly and children to eat. Re-mixed potato powder strengthened nutrition is the full price of nutritious food accepted by the world. The storage and transportation of the potato powder are safe, the cost is low, and shelf life is longer. Using the potato powder to replace the fresh potato will greatly simplify the production process; reduce the cost and crease productivity. The storage and transportation cost of the potato powder are far lower than the fresh potatoes.

It is estimate that 10 percent of potatoes produce is used as seed, 20% of produce are wasted due to inadequate storage and lack of proper transport infrastructure. The remaining 70% of potatoes (i.e.17.5 million tonnes) are consumed as fresh or processed. Of these almost 97% percent are consumed as fresh i.e. around 17.0 million tonnes are consumed as fresh potatoes is estimated at 15 kg per annum. Roughly 0.5 million tonnes of potatoes are used for processing.

Potato powder, Granulated and flakes are processed potatoes. It will help to increase the shelf life of potatoes. There are various machines are required for the processing of potatoes. Most of the machines are indigenously available very few of them may be imported. There are plenty of well verities of potato available for processing. The process technology can be easily available in India. As a whole the products have fair market demand. There is good scope for new entrepreneurs.

***Cost Estimation:***

Capacity	:	3000 MT/Annum
		5 MT Potato Powder/Day
		2.5 MT Potato Flakes/Day
		2.5 MT Potato Granules/Day
Plant & Machinery	:	665 Lakhs
Total Capital Investment	:	1240 Lakhs
Rate of Return	:	36%
Break Even Point	:	42%

**Potato Chips  
(Different Recipe and Flavours)**

Potato is widely consumed as food all over the world. Cooked potatoes, in various forms are offered in restaurants and refreshment stalls and varieties of processed potato products are available in the market. Surplus and cull potatoes are used as feed for livestock and also as raw material for the manufacture of starch, ethyl alcohol and a few other industrial products. Potatoes are consumed not only as a fresh vegetable, but also in a variety of processed forms. Dehydrated potato products have been known for long and are especially valued because they afford convenience for use; they have good storage stability and are relatively easy to transport. In recent years, there has been a great spurt in the consumption of processed products, such as potato chips, dehydrated mashed potatoes, and frozen potato products.

Potato wafers becomes cheap and quality competitive snacks items, for the market. Acceptance of potato chips it is necessary to make variety of potato chips by adding different type spice flavours or by adding some nutritional coating on the chips, it may be sweetened, salty or pungent, or any other developed acceptable variety. It is required to develop the different variety spices for the public acceptance of the product. Potato chips will be more palatable when there is variety of taste appearances and market potential of potato chips will be increased. There is pollution problem arises in this process which can be solved by proper measurement. As a whole the project has good market potential. Plant, machinery and raw material is easily available in India.

Potato chips are basically used for snacks purposes. Different varieties of potatoes are usually used for chips. Potato used for chip making has lower levels of sugar content. Besides being used as a daily food item in various vegetable preparations, potato today increasingly finds use in the form of chips or wafers as snacks food.

Potato Wafers and Chips are one of the most celebrated in the Ready



To Eat munchies market, relished in almost all the parts of the world. They serve as an appetizer, side dish, or snack. The Indian snacks market is estimated at US\$ 3 billion, with 50 percent comprising the organized snacks category.

In the Rs 19 bn branded (organized) snacks market, constituting over 40% of the market by value, Frito-Lay is estimated to command a market share of 45%, followed by Haldiram at 27% and ITC at 16%.

Companies, such as Bikanervala Food and Haldiram are meeting the demand for ready-to-eat snacks by scaling up their operations and launching new traditional snack food offerings, with longer shelf-life and better packaging. They have a large variety of products in different flavours and styles, tempting to the palate of all ages. The overall size of the snack food market is estimated at Rs 45 to Rs 50 bn. The market is reported to be growing at 7 to 8 % annually.

The organized snacks category is sub-divided into the traditional segment (bhujia, chanachur and the like), Western segment (potato chips, cheese balls etc.) and the newly established finger snacks segment, which is an adaptation of traditional offerings in the western format.

The demand of potato chips is increasing day by day, so there lies a great scope for further expansion in near future.

***Cost Estimation:***

Capacity	: 500 Kg/Day
Plant & Machinery	: 46 Lakh
Total Capital Investment	: 141 Lakh
Rate of Return	: 48%
Break Even Point	: 37%

***Information***

- ★ One Lac / Lakh / Lakhs is equivalent to one hundred thousand (100,000)
- ★ One Crore is equivalent to Ten Million (10,000,000)
- ★ T.C.I. is Total Capital Investment
- ★ All costs/amount given in INR ₹
- ★ NPCS can provide customized Detailed Project Report on all the projects
- ★ Visit us at: [www.niir.org](http://www.niir.org) Email : [info@niir.org](mailto:info@niir.org)

### Biomass Power Generation Plant

Biomass is biological material derived from living, or recently living organisms. In the context of biomass for energy this is often used to mean plant based material, but biomass can equally apply to both animal and vegetable derived materials. Biomass is a plant matter used to generate electricity or produce heat, usually by direct incineration. Examples include forest residues (such as dead trees, branches and tree stumps), yard clippings, wood chips and even municipal solid waste. In the second sense, biomass includes plant or animal matter that can be converted into fibers or other industrial chemicals, including biofuels. Industrial biomass can be grown from numerous types of plants including nuscantus thus, switch grass, hemp, corn, poplar, willow, sorghum, sugarcane and variety of tree species ranging from eucalyptus to oil palm.

India's energy development programme has been put to serve pressure with the ever increasing demand gap and mismatch of resources coupled with non-uniform growth curve. Increase in demand for energy due to rapid industrialization and growing population, constraint of financial resources for enhancing infrastructure use facility, limited reserves of coal and fossil fuels the challenges faced by India in the management and development of the power sector. There is good scope for biomass power plant in India. So new entrepreneur entered in this field will be successful.

#### *Cost Estimation:*

Capacity	: 1 MW
Plant & Machinery	: 373 Lakhs
Cost of Project	: 543 Lakhs
Rate of Return	: 50%
Break Even Point	: 51%

### Co-Generation Power Plant Based on Bagasse

Energy demand is fast increasing with rapid industrialization and urbanization in India. In a developing economy like India, generally energy demand is increasing at much faster pace than supply. Increasing demand also leads

to increase in cost of energy, hence high power tariffs for consumers. Increasing price of petroleum crude and other fossil fuels, world over and in India in the last two decades, has forced us to look for cheaper, renewable sources of energy. Use of bio-mass generated from Agriculture and Agro-process industries are the prime and readily available sources of renewable energy. Cogeneration based on Rankine Cycle is not new to the sugar industry. The term power generation in the engineering sense implies the production of mechanical or electrical power from some other source of energy e.g., thermal hydroelectric or electrochemical energy. India is the second largest producer of Sugar cane in world after Brazil. Indian Sugar mills both in the private and co-operative or joint sector have accepted the importance of implementing high efficiency grid connected cogeneration power plant for generating exportable surplus. In fact, additional revenue stream by sale of exportable power to State Electricity Boards (or third party customers), has become the only way for achieving long term sustainability, given the fiercely competitive domestic and international sugar markets.

Sugarcane Bagasse is an ideal renewable source of energy and is readily available from Sugar mills. Conventional means of power generation have used air, steam or water as a working medium for internal combustion engines reciprocating steam engines and steam and hydraulic turbines. Newer techniques such as magnetohydrodynamics, fuel-cell wind and solar power are under investigation and may eventually prove important.

Per capita power consumption is a barometer of country's prosperity, economic growth and industrialization. Major portion of the additional power requirement will have to be met through thermal generation. Co-generation power plant (Power Plant) based on bagasse makes use of generation of power from bagasse as fuel.

Cogeneration is the simultaneous production of process heat and electric power using single fuel. Biomass fuel can also be used in cogeneration plants for enhancing their efficiency. Biomass combustion facilities that produce electricity from steam-driven-turbine generators have a conversion efficiency of nearly 17 to 25 percent. Using a boiler to produce both heat and electricity (cogeneration) improves over all system efficiency to as much as 85 percent. That is, cogeneration converts 85 percent of the fuel's potential energy into useful energy in two forms; electricity and steam heat. Cogeneration facilities increase economic viability and profitability of an industry.

Cogeneration projects based on agro waste, like rice husk, bagasse etc. as fuel result is lowering the cost of energy generation, low capital investment, higher profitability of plant due to substantial reduction in cost of production and enhanced productivity and less consumption of costly and scarce fuels like diesel oil.

The installed power generation of the country stood at 167,077.36MW during FY2010-2011. The Indian government has set ambitious goals in the

11th plan for power sector owing to which the power sector is poised for significant expansion. In order to provide availability of over 1000 units of per capita electricity by year 2012, it is estimated that, need-based capacity addition of more than 100,000 MW would be required. This has resulted in massive addition plans being proposed in the sub-sectors of Generation, Transmission and Distribution leaving ample space for new players. There is a very good scope in the power sector and new entrepreneurs should venture into this field.

*Cost Estimation:*

Capacity	:	10 MW
Plant & Machinery	:	1423 Lakhs
Cost of Project	:	3214 Lakhs
Break Even Point	:	49%
Break Even Point	:	24%

**Gas Based Power Plant**

Electricity is an essential requirement for all facets of our life. It has been recognized as a basic human need. It is a critical infrastructure on which the socio-economic development of the country depends. Supply of electricity at reasonable rate to rural India is essential for its overall development. Equally important is availability of reliable and quality power at competitive rates to Indian industry to make it globally competitive and to enable it to exploit the tremendous potential of employment generation. Services sector has made significant contribution to the growth of our economy. Availability of quality supply of electricity is very crucial to sustained growth of this segment.

Recognizing that electricity is one of the key drivers for rapid economic growth and poverty alleviation, the nation has set itself the target of providing access to all households in next five years. As per Census 2001, about 44% of the households do not have access to electricity. Hence meeting the target of providing universal access is a daunting task requiring significant addition to generation capacity and expansion of the transmission and distribution network. Indian Power sector is witnessing major changes. Growth of Power Sector in India since its Independence has been noteworthy. However, the demand for power has been outstripping the growth of availability.

The National Electricity Policy aims at achieving the following objectives such as viability of Power - Demand to be fully met by 2012. The energy and peaking shortages will be overcome and adequate spinning reserve to be available and supply of reliable and quality power of specified standards in an efficient manner and at reasonable rates. The per capita availability of electricity is to be increased to over 1000 units by 2012 and many more. The gigantic task of rural electrification requires appropriate cooperation among

various agencies of the State Governments, Central Government and participation of the community. Education and awareness programmers would be essential for creating demand for electricity and for achieving the objective of effective community participation.

Inadequacy of generation has characterized power sector operation in India. To provide availability of over 1000 units of per capita electricity by year 2012 it had been estimated that need based capacity addition of more than 1,00,000 MW would be required during the period 2002-12.

The Government of India has initiated several reform measures to create a favorable environment for addition of new generating capacity in the country. The progress of implementation of capacity addition plans and growth of demand would need to be constantly monitored and necessary adjustments made from time to time. In creating new generation capacities, appropriate technology may be considered keeping in view the likely widening of the difference between peak demand and the base load.

Gas based power Plants are clean fuel power projects, which uses natural gas as a fuel for power generation and can distribute in grids. Since the Carbon Dioxide (CO<sub>2</sub>) emission due to combustion of natural gas is substantially less as compared to combustion of coal, lignite or naphtha thus helps in reducing GHG emission.

Indian economy is highly dependent on "Coal" as fuel to generate energy and for production processes. Thermal Power Plants are the major consumers of Coal in India, and yet the basic power needs of a large section of society are not being met. This results in excessive demands for electricity and places immense stress on the environment. Changing coal consumption patterns will require a multi-pronged strategy focusing on demand, reducing wastage of energy and the optimum use of Clean Energy Sources like Natural Gas. A gas based power plant has excellent environmental benefits in terms of reduction in carbon emissions and coal resource conservation. Also, gas based power plants would not lead to production of huge quantities of solid waste (like ash in thermal power plants) and hence reduces the burden of solid waste disposal.

There is a very good scope in the power sector and new entrepreneurs should venture into this field.

***Cost Estimation:***

Capacity	:	7105968 MW/Annum 1014 MWh
Plant & Machinery	:	4369.30 Crore
Cost of Project	:	4672 Crore
Rate of Return	:	48%

### Solar Photovoltaic Power Plant

The growing industrialization and associated use of energy have led the world to face energy crisis which is gaining serious concern day by day. The development of a new energy basis for continued economic growth has therefore become an urgent necessity.

With the help of solar power technology, we can tap sun energy in many ways. Solar cells, otherwise known as photovoltaic or photoelectric cells are the most popular devices that help to convert sunlight into electricity. In combination with modules, they are used to manufacture solar panels. Solar energy is also used in the functioning of solar water heaters, melting steel, creating hydrogen fuel and making electricity through solar furnaces. The reflective surfaces used in these solar furnaces helps in concentrating all of sun's energy into a strategic point which in turn generates a large amount of heat and there by electricity. The majority of photovoltaic modules are used for grid connected power generation.

For more than three decades, solar power generated electricity has been dismissed as too costly. But the cost of solar generated electricity is consistently coming down, while the cost of conventional electricity is increasing. Advances in solar cell technology, conversion efficiency and system installation have allowed photovoltaic system (PV) to achieve cost structures that are competitive with other peaking power sources. PV has the unique advantage among renewable resources of being able to produce power anywhere: deserts, cities or suburbs. Though the installation cost of PV is more, but it can be selectively deployed on the grid wherever and whenever needed to reduce distribution capacity constraints and transmission congestion while producing pollution-free power. Both capital costs and operating and maintenance costs are driven by the choice of technology and the area of the solar system.

The time is right for the world to adopt the clean and renewable energy source as the major electricity producer. With most part of India enjoying close to 300 sunny days a year, even if 0.5% of land area is brought under solar power, it can meet the entire energy requirement of India in 2030. The Indian government has announced its Solar Mission under the National Action Plan on Climate Change in November 2009 with the goal to generate 1,000 MW of solar power by 2013 and 20,000 MW by 2020.

World solar photovoltaic (PV) market installations reached a record high of 7.3 GW in 2009, representing growth of 20% over the previous year, according to the annual PV market report issued by Solarbuzz. The PV industry generated \$38.5 billion in global revenues in 2009, while successfully rising over US\$13.5 billion in equity and debt, up 8% on the prior year.

Indian Government has taken several steps, both on the supply side and the demand side, to offer key incentives to aid the development of solar PV



industry. Currently India has 10-12 solar PV cells manufacturers producing about 100 MW of solar PV cells and about 20 manufacturers engaged in module manufacturing with installed capacity of 120 MW. Moreover, currently India has more than 200 manufacturers of solar water heaters and 40 solar cooker manufacturers, and also 5-6 manufacturers are involved in producing solar drying, cooking, process heat, and air conditioning applications.

India already is witnessing a huge surge in applications for solar power, varying from street lighting to water heating. Decentralized Distributed Generation (DDG) for meeting rural demand, back-up power for telecommunications, roof based captive systems for individual industries and grid interactive solar power plants are some prominent sectors offering significant market potential for solar PV in India.

There is a bright future and good scope for new entrepreneurs in this sector in the coming years.

***Cost Estimation:***

Capacity	: 1 MW
Plant and Machinery	: 1435 Lakhs
Cost of Project	: 1671 Lakhs
Rate of Return	: 11%
Break Even Point	: 93%

**Solar Thermal Power Plant**

The growing industrialization and associated use of energy have led the world to face energy crisis which is gaining serious concern day by day. In principle, solar energy can supply all the present and future energy needs of the world on a continuous basis. This makes it one of the most promising of the non-conventional energy sources. India has made marked gains in the construction of both hydro-electric and thermal power generating plants. Installed generating capacity has increased manifold since demand has increased at an even faster rate. Thus the burden of power generation is still on fossil fuels.

Solar energy can play an important role in meeting energy demands in future years. Thus greater stress should be given on technical development for collection and storage of solar energy. If solar energy is converted to electrical energy we can meet the growing demands. Thus Indian Industries will get a great benefit.

Solar systems are powered by energy from the sun. Two generic types of solar-electric systems are solar photovoltaics and solar thermal electric. The direct utilization based on thermal and photovoltaic are of prime importance because it involves both storage and conversion into chemical as well as electrical form of energy.

Solar thermal technologies convert radiant energy from the sun of thermal energy. For low-temperature applications (typically below about 200° F [95° C]) such as domestic water heating, concentration of the sunlight is not required. To achieve the high temperatures required for generation of electrical power, the solar energy must be concentrated.

All solar thermal electric technologies include a collector, which redirects and concentrates the insulation on a receiver. In the receiver, the solar energy is absorbed, heating a fluid that powers a heat engine to generate electricity. In some systems, a heat exchanger may be used for power generation. Three principal solar thermal concentrator concepts are currently under development for power generation: parabolic trough, central receiver, and parabolic dish. The parabolic trough is the most advanced of the concentrator systems. This technology is used in the largest grid connected solar-thermal power plants in the world.

A parabolic trough collector has a linear parabolic-shaped reflector that focuses the sun's radiation on a linear receiver located at the focus of the parabola. The collector tracks the sun along one axis from east to west during the day to ensure that the sun is continuously focused on the receiver. Because of its parabolic shape, a trough can focus the sun at 30 to 100 times its normal intensity (concentration ratio) on a receiver pipe located along the focal line of the trough, achieving operating temperatures over 400 degrees Celsius.

A collector field consists of a large field of single-axis tracking parabolic trough collectors. The solar field is modular in nature and is composed of many parallel rows of solar collectors aligned on a north-south horizontal axis. A working (heat transfer) fluid is heated as it circulates through the receivers and returns to a series of heat exchangers at a central location where the fluid is used to generate high-pressure superheated steam. The steam is then fed to a conventional steam turbine/generator to produce electricity. After the working fluid passes through the heat exchangers, the cooled fluid is recirculated through the solar field. The plant is usually designed to operate at full rated power using solar energy alone, given sufficient solar energy.

Flat Plate Collectors are the most common type of solar water heating systems for residential and commercial applications. Flat plate collector systems are used comfort heating of a home or commercial building in the winter and for domestic hot water production throughout the year. Flat plate collectors usually heat water to temperatures ranging from 150° to 200° F (66° to 93° C). The efficiency of flat plate collectors varies from manufacturer to manufacturer, and system to system, but usually ranges from as low as 20% to as high as 80%.

Solar thermal power is one of the most promising ways to provide renewable energy, giving the fact that it can compete in the middle/long term

with conventional power plants. As a result of international cooperation and government grants, many demonstration projects have been carried out or are still in progress.

India supports development of both solar thermal and solar photovoltaics (PV) power generation. To demonstrate and commercialize solar thermal technology in India, MNES is promoting megawatt scale projects such as the proposed 35MW solar thermal plant in Rajasthan and is encouraging private sector projects by providing financial assistance from the Ministry.

Involvement in the project of various players in the energy sector, such as local industries, the private construction and operations contractors, Rajasthan State Power Corporation Limited (RSPCL), Rajasthan State Electricity Board (RSEB), Rajasthan Energy Development Agency (REDA), Central Electricity Authority (CEA), MNES and others, will help to increase the capacity and capability of local technical expertise and further sustain the development of solar power in India in the longer term.

### **Thermal Power Plant (5 MW)**

Power generation is an essential requirement of economic growth of a country. Generation involves with the production of power and transmission and distribution function is of carrying the generated power to the doorsteps of the consumer.

Large number of power plants of varied types and sizes exist in the country. These are utilized in process industry. Thermal plant's inducing co-generating power plants could, therefore, play a supplementary role in meeting the country's power demand. A weak power infrastructure impedes the growth potential and pulls back the growth initiatives. Thermal power plants are owned by specific industries, which consume all the power produced for its production purposes. Every person, who has constructed a thermal power plant and maintains and operates such plant, shall have the right to open access for the purposes of carrying electricity from his/her thermal power plant to the destination of his/her use; provided that such open access shall be subject to availability of adequate transmission facility and such availability of transmission facility shall be determined by the Central Government.

The power supply gap between the required energy and available energy is increasing everyday.

#### ***Cost Estimation:***

Capacity	:	5 MW
Plant & Machinery	:	1753 Lakhs
Cost of Project	:	2076 Lakhs
Rate of Return	:	52%
Break Even Point	:	29%

### Rotogravure Printing

Printing as an art of graphic is so ancient that it is not certain when it was invented. It is reported to have originated in China. Shortly after the appearance of photography attempts were made to produce printing plates for intaglio by photographic means. Rotogravure employs an equalised polished copper cylinder as the printing surface and makes use of a screen to break-up the light and dark areas into small unshaded dots. Gravure or intaglio printing finds applications in the production of newspaper, supplements, book review, magazines, films and other packing materials. There is good scope for rotogravure printing units. Any new entrepreneur can invest in this project.

#### *Cost Estimation:*

Plant Capacity	: 51758 Sq. Mtrs./Day
Plant & Machinery	: Rs. 40.8 Lakhs
W. C. for 3 Months	: Rs. 127.0 Lakhs
Total Capital Investment	: Rs. 218.0 Lakhs
Rate of Return	: 38.90%
Break Even Point	: 49.55%

### Photo-Emulsion for Rotary Screen Printing

The invention of printing in the western world is credited to Johannes Gutenberg in 1450 A.D. however, movable type was used to print on a press as early as 1041 A.D. by the Chinese & later by the Japanese and Koreans. Printing is considered to be one of the most important inventions in the history of mankind & one of the main factors advancing civilization from the past & middle ages. There are four main printing processes most widely used :- Relief or letter press; Printing of Flexography, Intaglio or Gravures Printing, Planographic or (Lithography printing & collotype) and Stencil or porous printing or screen printing.

Commercially photographic stencil is very important in printing. It gives an excellent & beautiful impression on the material. Photographic screen process may be classified into two categories as follows-direct photographic

printing screens, indirect or transfer photographic printing screens. The printing industries being a service industry has in the past grown more or less in consonance with the overall industrial growth in the country. Given the good correlation between the growth of the printing industry and overall industrial growth, of the printing industry and overall industrial growth, it is perfectly valid to assume that the future growth of the printing industry would also be governed by the overall industrial growth in the country. You can come in this project. There is very good scope for new investment.

#### *Cost Estimation*

Plant Capacity	: 150 kg./Day
Plant & M/c	: 1 Lakhs
Total Capital Investment	: 19 Lakhs
Rate of Return	: 16%
Break Even Point	: 49%

#### **Flexographic Printing**

Flexographic printing is used widely for the printing of bold designs and extremely attractive effects can be achieved using 3 or 45 colours. It is used widely for printing on paper, laminated aluminium foil, cellophane film, polypropylene, polyethylene etc. assuming major importance in printing polyethylene films primarily because of the relatively inexpensive nature of the rubber stereotypes. Machinery has also developed considerably in India. Printing requirements of the country will increase with increase in industrialization. Demand for printed packaging material is also on the increase. This can be a good profit earning business for entrepreneurs.

#### *Cost Estimation:*

Plant Capacity	: 20,000 Sq. Mtrs/Day
Plant & Machinery	: Rs. 13.15 Lakhs
W. C. for 3 Months	: Rs. 50.82 Lakhs
Total Capital Investment	: Rs. 77.87 Lakhs
Rate of Return	: 41.69%
Break Even Point	: 41.15%

#### **Flexible Packaging with Gravure and Flexo Printing with Extrusion in 3/5/7 Layers**

One of the most popular forms of packaging is Flexible Packaging. Flexible Package is easy to hold, convenient to store and simple to use. Made up of multi-layer laminated sheets of plastics (PVC, LDPE, HDPE, BOPP, BOPET), paper, cloth, or metal foils.

The main products of this business are laminates made with various combinations of Polyester, BOPP, poly, metalized & hologram films and others

and supplied in roll form and in various preformed pouches, manufacture of rotogravure cylinders for various types of rotogravure printing, Anilox/Coating, Rollers for flexo printing and Shims for holographic embossing and holograms and printing ink and adhesives and packaging & processing machines. This business involves customization according to the needs of customer.

It has successfully developed several new packaging material for various applications suitable for Food Industry, the Bakery and Confectionery Industry, Beverage Industry and the Personal Care Products Industry.

#### **The Benefit of Flexible Packaging is**

- ★ It helps your product stay clean, safe and well protected from pilferage and adulteration.
- ★ It helps your product to acquire sound barrier protection against moisture and gases and protection from damage and wastage.
- ★ It offers your product extreme convenience of handling and disposal after use.
- ★ It easily fits in with the shape of the contents thereby helping to cut down excess storage and transport costs.
- ★ It offers tremendous saving in raw material consumption through usage extension to as much as four times.
- ★ It absorbs more products per a package. A good example is coffee / nuts and snacks that come in foil brick packs and pouches rather than in cans or jars.
- ★ It is environment friendly and helps to conserve energy for conversion.
- ★ It helps a product manufacturer to enhance their product brand image leading in turn to better sales.

The capacity overhang can be gauged from the fact that as against an aggregate capacity of 1.74 lakh Tonnes, the domestic demand is currently only around 85,000 tonnes. The dependence on exports will be critical to the survival of the secondary, players in the extrusion markets. The global flexible packaging market is projected to grow to 17.5 mn tons in 2014 at an average growth rate of 3.4%, as per a report by PIRA International. Flexible packaging has been one of the fastest-growing sectors of the packaging market over the past decade. Flexible packaging substrates provide opportunities to reduce materials, lower package weight and cut costs.

Properties of flexible packaging can be easily tailored to meet demanding specifications for a wide range of products. Over the years, the flexible packaging market has developed from simple paper wrapping and bags to very sophisticated multilayer and multimaterial packaging for barrier protection and shelf-life extension. Flexible packaging films can be made of single-web substrates such as flexible plastics (PE, PP, polyester or PA), flexible foils



and flexible papers or can be coated, laminated or coextruded with other materials to enhance their physical properties in various ways.

Better Quality of Life through Better Packaging' sums up the important place that packaging occupies in a modern economy. There is a very good scope and new entrepreneurs should venture into this field.

***Cost Estimation:***

Capacity	:	1500 MT/Annum (Printed Film Packaging) 1500 MT/Annum (Printed Coated Paper)
Plant & Machinery	:	365 Lakhs
Cost of Project	:	824 Lakhs
Rate of Return	:	44%
Break Even Point	:	59%

***Information***

- ★ One Lac / Lakh / Lakhs is equivalent to one hundred thousand (100,000)
- ★ One Crore is equivalent to Ten Million (10,000,000)
- ★ T.C.I. is Total Capital Investment
- ★ All costs/amount given in INR ₹
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### Precipitated Silica from Rice Husk Ash

Rice husk is an agricultural residue easily available in rice producing countries. India is a major rice producing country, and the husk generated during milling is mostly used as a fuel in the boilers for processing paddy, producing energy through direct combustion & or by gasification. The rice husk contains about 75% organic volatile matter & the balance 25% of the weight of this husk is converted into ash during the firing process, is known as rice husk ash (RHA). This RHA in turn contains around 85%–92% amorphous silica. About more than 20 million tons of RHA are produced annually in India. Generally rice husk is not used as cattle feed since its cellulose & other sugar contents are low. So the RHA produced is a great environment threat causing damage to the land & the surrounding area in which it is dumped. Lots of ways are being thought off for disposing them by making commercial use of this RHA.

Silica is one of the valuable inorganic chemical compounds. It can exist in gel, crystalline and amorphous forms. It is the most abundant material in the earth's crust. Silica is the major constituent of rice husk ash. With such a large ash content & silica content in the ash it becomes economical to extract silica from the ash, which has wide market & also takes care of ash disposal.

Precipitated Silica (also called particulate silica) is composed of aggregates of ultimate particles of colloidal size that have not become linked in massive gel network during the preparation process. It is an amorphous form of silica; the word amorphous denotes a lack of crystal structure, as defined by x-ray diffraction. Early interest in amorphous silica was purely academic.

The ash produced after the husks have been burned is high in silica. RHA can be used in a variety of application like: green concrete, high performance concrete, ceramic glaze, water proofing chemicals, roofing shingles, insulator, specialty paints, flame retardants, carrier for pesticides, insecticides & bio fertilizers etc. Precipitated silica is also used as filler for paper & rubber, as a carrier & diluents for agricultural chemicals, as an anti caking agent, to control viscosity & thickness and as a cleansing agent in toothpastes & in cosmetics.

The distinguishing feature of the growth of precipitated silica industry in India is that it has classifiably flourished in the small-scale sector. Readily available new materials low capital investment & high rates of return offer a distinct advantage to the small-scale manufacturers to venture into this field. There is a very good scope in this sector.

***Cost Estimation:***

Capacity	:	4500 MT/Annum
Plant & Machinery	:	816 Lakhs
Total Capital Investment	:	1820 Lakhs
Rate of Return	:	37%
Break Even Point	:	40%

**Particle Board from Rice Husk**

Rice hulls (or rice husks) are the hard protecting coverings of grains of rice. Construction industry is one of the fastest growing sectors in India. Rapid construction activity and growing demand of houses has lead to the short fall of traditional building materials. Bricks, Cement, sand, and wood are now becoming scares materials. Wood or wood based composite boards with lightweight & high strength are still a preferred option for construction due to their reasonable costs. The growing shortage of wood has led to the development of suitable alternative materials. Rice husk particle board is one such material which is being considered as a potential substitute for wood & wood based boards.

Agricultural waste or residue is made up of organic compounds from organic sources such as rice straw, oil palm empty fruit bunch, sugar cane bagasse, coconut shell, and others. Rice husk from paddy (*Oryza sativa*) is one example of alternative material that can be potentially used for making particle board. Rice husk is unusually high in ash, which is 92 to 95% silica, highly porous and lightweight, with a very high external surface area. Its absorbent and insulating properties are useful to many industrial applications, such as acting as a strengthening agent in building materials. Rice husks are processed into rectangular shaped particle boards.

Most particle boards produced is in the intermediate density range from 0.40 to 0.80 g/cm<sup>3</sup>, low density boards in the range from 0.25 to 0.40 g/cm<sup>3</sup> are insulating type whereas high density boards in the range from 0.80 to 1.20 g/cm<sup>3</sup> are called hard board type. Industry size estimated at Rs. 1,000 Crores, about 0.49 mln. m<sup>3</sup> 90% Pre laminated, 10% plain 60% Cheaper than Plywood Industry growing at around 20%, 50% imported, Dominated by organized sector, Highly profitable from agro based raw materials. The Indian market for particleboard and plywood is estimated in value terms, at over Rs 17 billion. Of the total market, particleboard accounts for over 30% of the market with the rest over 70% accounted by plywood segments.

Particle boards are slowly gaining acceptance as a substitute for other board materials such as plywood and block boards and even for sawn timber whenever it is competitive in price. This trend is accepted to strengthen further in the coming years as the availability of plywood, blockboards and timber is declining and their prices are showing an upward trend. As the pressure on the limited forest resources increases there would be a greater need to manufacture reconstituted wood boards such as particle boards which is normally manufactured from forest management wastes whereas sawn timber and plywood and block boards require prime quality logs.

As in many emerging markets, India is experiencing a rapid phase of urbanization with a change in lifestyles, a growing demand for engineered wood and agro based panel products, and a high infrastructure, industry sources expect positive growth for wood and agro based products such as plywood, particleboard, medium density fiberboard, oriented-strand board and laminated veneer lumber in near future.

So, there is a good scope of the product in the near future.

***Cost Estimation:***

Capacity	:	1500000 Pcs. /Annum Size of Board 6'x 3'x 0.0471' Each Board Weight 10-12 Kgs. 60 Mt Board per Day.
Plant & Machinery	:	110 Lakhs
Total Capital Investment	:	733 Lakhs
Rate of Return	:	47%
Break Even Point	:	32%

**Sodium Silicate from Rice Husk**

Sodium Silicate is a colourless compound of oxides of sodium and silica. Sodium silicate is the generic name for a series of compounds derived from soluble sodium silicate glasses. They are water solutions of sodium oxide and silicon dioxide combined in various ratios. These are sold as 20% to 50% aqueous solutions called water glass.

Rice husk is an alternative source for silica. Rice husk a major by-product of the rice milling industry, is one of the most commonly available lignocellulosic materials that can be converted to different types of fuels and chemical feedstock through a variety of thermo chemical conversion processes. Rice husk is an agricultural residue abundantly available in rice producing countries. The husk surrounds the paddy grain.

Sodium silicate is an excellent adhesive for sealing fiberboard boxes because it sets quickly and firmly holds the flaps together. Sodium silicate solutions of widely varying ratios are used for making many kinds of cement.

including types for acid-proof construction, refractory used, and binding thermal insulating materials. There are a number of outstanding advantages of sodium silicates as binders in the cement mixtures. These include resistance of the set cements to acid, to high temperature, and to water.

The annual rice husk produce in India amounts is generally approximately 120 million tons. India is a major rice producing country and the husk generated during milling is mostly used as a fuel in the boilers for processing paddy, producing energy through direct combustion and/or by gasification. The different types of biomass used for gasification, rice husk has a high ash content varying from 18-20%.

The demand of sodium silicate is increasing day by day. So, there is a good scope of enter into this field.

***Cost Estimation:***

Capacity	:	4500 MT/Annum
Plant & Machinery	:	84 Lakhs
Total Capital Investment	:	220 Lakhs
Rate of Return	:	40%
Break Even Point	:	47%

***Information***

- ★ One Lac / Lakh / Lakhs is equivalent to one hundred thousand (100,000)
- ★ One Crore is equivalent to Ten Million (10,000,000)
- ★ T.C.I. is Total Capital Investment
- ★ All costs/amount given in INR ₹
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### Rubber Sheet

Rubber is a collective term for macromolecular substances of natural or synthetic origin (natural rubber or synthetic rubber). Natural rubber (abbreviated to NR) primarily comprises polyisoprene and is harvested from the milky white latex of a number of species of plants which flourish in the tropics, above all from the Spurge family (Euphorbiaceae). The most of the rubber products that are used today is made from synthetic rubber as natural rubber has certain mechanical, chemical and environmental resistance limitations. So synthetic rubbers are formulated in a proper and are used to manufacture a wide range of rubber products.

Rubber is a material which is used to produce different objects used for various applications. A popular and a widely demanded use of rubber form are sheets which are used for different purposes. Rubber sheets are available in various lengths and widths. These sheets are cut according to customer requirements. Various types of rubber are used to make sheets. These sheets are very popular and used in an extensive range application. There are a comprehensive range of rubber sheets for general, industrial and mining applications. These sheets are also available in vulcanized black as well as coloured sheets for technical uses and industrial applications. There can also be smooth surfaced rubber sheets or with a canvas-type print on one or both sides of the rubber sheets. These sheets insertions are usually designed for use in applications where stresses are generally static and pressures are low. There can be cloth insertion, metal mesh insertion, gauze, nylon cloth, and copper insertion.

Moulding is an operation of shaping and vulcanizing the rubber compound by mass of heat and pressure, in mould of appropriate form. The goods thus produced are known as moulded goods. These moulded goods are used in day to day life in household electrical, surgical and automotive and other applications several thousands of types of moulded goods are being produced. There are many types of rubber sheets produced and are available in markets. They are neoprene rubber sheet, nitrile rubber sheet, EPDM rubber sheet, natural rubber sheet, hypalon rubber sheet, viton rubber sheet, silicone rubber sheet, SBR rubber sheet, etc.



Global demand for industrial rubber products is estimated to rise to 4.3% annually through 2013 to \$97.8 billion. Market advances in developing areas will further increase due to healthy economic growth, rising personal income levels, ongoing industrialization efforts and also due to growth in manufacturing output and fixed investment expenditures. The industrial equipment market, which includes industrial machinery and equipment, off-road vehicles, will continue to hold the largest share of aggregate demand in 2013.

India's production varies between 6 and 7 lakh tons annually which amounts to Rs. 3000 crores. Seventy percent of the total rubber production in India is in the form of Ribbed Smoked Sheets (RSS). This is also imported by India accounting for 45% of the total import of rubber. The Indian rubber industry has a turnover of Rs 12000 crores. Most of the rubber production is consumed by the tyre industry which is almost 52% of the total production of India. Among the states, Kerala is the leading consumer of rubber, followed by Punjab and Maharashtra. Though, India is one of the leading producers of rubber but it still imports rubber from other countries. At present, India is importing around 50000 tons of rubber annually.

There is a very good scope in this field. New Entrepreneurs venturing in this field will find immense market potential.

***Cost Estimation:***

Capacity	:	600 MT/Annum
Plant & Machinery	:	73 Lakhs
Total Capital Investment	:	238 Lakhs
Rate of Return	:	40%
Break Even Point	:	42%

**Butyl Rubber-Polyisobutylene Rubber**

Butyl rubber is a copolymer of an iso olefin and one or more, preferably conjugated, multi olefins as co-monomers. Commercial butyl comprises a major portion of isooletin and a minor amount, not more than 2.5 wt%, of a conjugated multiolefin. The preferred isooletin is isobutylene.

Butyl rubber (IIR, is an Isobutylene-isoprene copolymer is actually the copolymer of isobutylene and a small amount of isoprene. Its grade varies in isoprene content and viscosity, which is related to molecular weight. Butyl rubber is currently the only rubber that is impermeable to air. Resulting from low levels of unsaturation between long polyisobutylene segments, the primary attributes of butyl rubber are excellent impermeability/air retention and good flex properties. The first major use of butyl rubber was Tire inner tubes, and this continues to be a significant market today.

With the phenomenal increase in number of automobiles in India during recent years the demand of tyres and tubes as original equipment and as

replacement has also increased. Also the requirement of tubes is directly related to growth of automobile. The production of automobiles is forecast to continue to rise and is indicative of buoyant economic conditions for tyre and tube industry. The Automotive industry is the key driver of any growing economy. A sound transportation system plays a pivotal role in a country's rapid economic and industrial development. The automobile industry comprises automobile and auto component sectors. It includes passenger cars; light, medium and heavy commercial vehicles; multi-utility vehicles such as jeeps, scooters, motorcycles, three-wheelers and tractors; and auto components like engine parts, drive and transmission parts, suspension and braking parts, and electrical, body and chassis parts.

There is a good scope for butyl rubber. Due to the long-time monopoly of technology, market and price, the profit rate of butyl rubber is quite high. New entrepreneurs venture into this field will be successful in the long run.

***Cost Estimation:***

Capacity	:	15000 MT/Annum
Plant & Machinery	:	314 Lakhs
Total Capital Investment	:	875 Lakhs
Rate of Return	:	40%
Break Even Point	:	42%

## ***Information***

- ★ One Lac / Lakh / Lakhs is equivalent to one hundred thousand (100,000)
- ★ One Crore is equivalent to Ten Million (10,000,000)
- ★ T.C.I. is Total Capital Investment
- ★ All costs/amount given in INR ₹
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### Toilet Soap

Toilet soaps account for the largest single share of about 13% in the estimated Rs 530 bn FMCG market. The toilet soaps market is estimated at over 650,000 tpa, which includes some imports. The toilet soaps market is getting saturated at a high penetration level of 98% and is growing at a very modest rate of over 5% since 2000-01. The toilet soap, once only an urban phenomenon, has now penetrated practically all areas including remote rural areas. The incremental demand flows from population increase and rise in usage norm stimulated as it is by a greater concern for hygiene. Increased sales revenues would also expand from upgradation of quality or per unit value.

It goes without saying that soap is indispensable in our daily life. Accordingly, the manufacturing industry should continue to develop as one of the most important industries. Soap may broadly be classified by use as soap household, industrial soap and special soap. Among them, the consumption of herbal soap is used for medical purposes. Household soap, which is most important quantitatively accounts for the larger part of the consumption of soap. Now-a-days herbal products are getting more popularity all over world, so herbals soaps have also good domestic as well as export potential.

Soap manufacture is very prospective industry with unlimited scope for future. New comer can well venture into this field.

#### *Cost Estimation:*

Capacity	:	14400 MT/Annum
Plant & Machinery	:	399 Lakhs
Total Capital Investment	:	3000 Lakhs
Rate of Return	:	52%
Break Even Point	:	28%

### Soap and Detergent Powder

Soaps are the earliest form of detergents. Though at present, the term detergent is used for synthetic detergents derived from petroleum products. The origin of soap making is unknown. Detergents are defined as complete washing or cleaning products, which contain among their ingredients an organic surface-active compound (Surfactant) that passes soil-removal properties. Frequently the term detergent is used synonymously with surfactant but common industry practice treats the surfactant as one component of a done here. Additionally this discussion treats primarily, only the so-called synthetic detergents, excluding those products in which soap is the sole or predominant surfactant.

Detergent cake and detergent powder are largely used in the domestic houses, commercial sectors, hotel industries, garment industries and in many other sections of the society. There is high price, medium price and low priced detergent available. There are different kinds of raw material used in the industries. There is large demand of this consumer item. There are renowned organized as well as unorganized private sectors, engaged in this production. The technology, involved in the high priced detergent powder and cakes is charged nowadays.

From the 1940's on-ward, synthetic detergents have expanded rapidly all over the world. Their rapid development has been stimulated by the enormous and fast growth of the international petro-chemical industry. The transition from conventional hard soaps to synthetic detergent cake has been rapid and irreversible response by consumers. So that to-day, synthetic detergent accounts in most developed and developing countries in the world. To improve detergency of the detergent cakes & powders, certain other components were added to it known as builders, synergies, fillers and brighteners etc.

Detergents, as a constituent of the overall FMCG industry, accounts for a near 12% of the total demand for all FMCG products estimated at over Rs 530 bn. Detergents, chemically known as alfa olefin sulphonates (AOS) are used as fabric brightening agent, anti-deposition agent, stain remover and as a bleacher. It represents an increase of 15% over that of preceding year. A major input for the production of detergents is a petrochemical, Linear Alkyl Benzene (LAB), while soaps rely more on an inorganic chemical, caustic soda, as a major input. Detergents are available as powder, bars and liquids. Bars make up for less than half of the market, while powders have more than a third of the market. Liquids have 12% presence in the market. The bar market is dominated by Hindustan Lever (now Hindustan Unilever - HUL) with a share of over 40% held by its brands - Rin, Wheel, 555, Shakti, OK. The super-premium market, making up for around 10% of the overall detergents market, is dominated by Surf Excel from HUL and Ariel from Procter & Gamble (P&G). The two together have a near 75% market with the rest coming in

from players like Henkel SPIC. In the sub premium segment, Nirma from Nirma Soaps and Wheel from HUL are the major brands with small presence from an array of brands like Trilo, Hipolin, Tide, Key, Chek and others.

The detergent market in India is dominated by HUL. Nirma is the second largest player with an overall market share of 19%. Nirma is more dominant in the states of Gujarat, Rajasthan, Punjab and Haryana, that is Northwest India. Nirma has the highest market share of around 40% in Gujarat. It has the highest market share in the mass segment, like toilet soaps.

There is a very good scope of this product and new entrepreneurs should venture into this sector.

#### ***Cost Estimation:***

Capacity	:	6000 MT/Annum
		Detergent Cake 10 MT/Day
		Detergent Powder 10 MT/Day
Plant & Machinery	:	66 Lakhs
Total Capital Investment	:	577 Lakhs
Rate of Return	:	48%
Break Even Point	:	33%

#### **Soap Noodles**

Soap Noodles are made from vegetable oils, such as palm oil, coconut oil or olive oil and animal fats. These are saponified usually using sodium hydroxide, to form a salt of the fatty acids. Soap noodles constitute the very basic form of soap. Once this has been accomplished, the soap is molded and pressed into its final shape, stamped with the brand and packaged.

Soaps are water-soluble sodium or potassium salts of fatty acids. Soaps are made from fats and oil, or their fatty acids, by treating them chemically with a strong alkali. Soaps found in the home can be grouped into four general categories: personal cleansing, laundry, dishwashing and household cleaning. Within each category are different product types formulated with ingredients selected to perform a broad cleaning function as well as to deliver properties specific to that product. Knowing the different products and their ingredients helps you select the right product for the cleaning job.

Soap is a good cleaning agent, its effectiveness is reduced when used in hard water. Hardness in water is caused by the presence of mineral salts – mostly those of calcium and magnesium, but sometimes also iron and manganese. The mineral salts react with soap to form an insoluble precipitate known as soap film or scum.

Soaps and detergents are essential to personal and public health. Through their ability to loosen and remove soil from a surface, they contribute to good personal hygiene; reduce the presence of germs that cause infectious diseases;

extend the useful life of clothes, tableware, linene, surface and furnishings, and make our homes and workplaces more pleasant. In India, there is very good demand of soap.

So, Due to wide end uses, it is found that there is good demand of Soap Noodle. Entrepreneurs can well venture into this field.

***Cost Estimation:***

Capacity	:	3600 MT/Annum
		Soap Noodles
Plant & Machinery	:	Rs. 156 Lakhs
Total Capital Investment	:	Rs. 665 Lakhs
Rate of Return	:	41%
Break Even Point	:	41%

**Surfactants**

Surfactants are compounds that lower the surface tension of a liquid, the interfacial tension between two liquids, or that between a liquid and a solid. Surfactants may act as Air freshener, detergents, wetting agents, emulsifiers, foaming agents, and dispersants. Surfactants are usually organic compounds that are amphiphilic, meaning they contain both hydrophobic groups (their tails) and hydrophilic groups (their heads). Therefore, a surfactant molecule contains both water insoluble (or oil soluble) component and water soluble component. Surfactant molecules will diffuse in water and adsorb at interfaces between air and water or at the interface between oil and water, in the case where water is mixed with oil. The insoluble hydrophobic group may extend out of the bulk water phase, into the air or into the oil phase, while the water soluble head group remains in the water phase. This alignment of surfactant molecules at the surface modifies the surface properties of water at the water/air or water/oil interface.

**Dynamics of Surfactants at Interfaces**

The dynamics of adsorption of surfactants is of great importance for practical applications such as foaming, emulsifying or coating processes, where bubbles or drops are rapidly generated and need to be stabilized. The dynamics of adsorption depends on the diffusion coefficient of the surfactants. Indeed, as the interface is created, the adsorption is limited by the diffusion of the surfactants to the interface. In some cases, there exists a barrier of energy for the adsorption or desorption of the surfactants, then the adsorption dynamics is known as 'kinetically-limited'. Such energy barrier can be due to steric or electrostatic repulsions. The surface rheology of surfactant layers, including the elasticity and viscosity of the surfactant layers plays a very important role in foam or emulsion stability.



### Application

Surfactants play an important role as cleaning, wetting, dispersing, emulsifying, foaming and anti-foaming agents in many practical applications and products, including: Air Freshener, Dish wash liquid, Glass cleaner, Phenyl, Toilet cleaner, Floor cleaner, Hand wash, Herbicides (some), Insecticides, Quantum dot coatings, Biocides (sanitizers), Toothpastes, Firefighting, Pipelines, liquid drag reducing agent etc.

### Market Potential

Global demand for anionic surfactants was approximately 6.5 million tons in 2010. Anionic and non-ionic surfactants combined account for roughly 85 percent of global demand for surfactants. Most important buyers worldwide include manufacturers of household cleaners & detergents. Industrial cleaners accounted for just less than 9% of global consumption in 2010. Body care products and cosmetics had a 9.5% share. Other industrial applications such as agrochemicals, photo chemicals, oil field chemicals, construction materials, food stuffs, adhesives, lubricants as well as metal working, mining and pulp & paper accounted for approximately 11% of worldwide consumption. Both laundry care and dishwashing products had extremely constrained rises in unit prices as mass-market categories such as hand dishwashing and bar detergents witnessed intense competition over the year. However, 2010 sales growth in terms of retail volume was comparable to and slightly higher than that seen over the review period. Surfactant demand from manufacturers of household cleaners like floor cleaner, toilet cleaner, glass cleaner etc. & detergents is predicted to rise by 2.6% per year by 2018.

### *Cost Estimation:*

Capacity	:	12000 Ltrs/day (Air Freshner, Dish Washer, Glass Cleaner, Phenyl Black/White, Toilet Cleaner, Floor Cleaner, Hand Wash)
Plant and Machinery	:	83 Lakhs
Total capital Investment	:	1328 Lakhs
Rate of return	:	49%
BEP	:	33%

### Curcumin (Turmeric); The Indian Solid Gold

Curcumin is the principal curcuminoid of the popular Indian spice turmeric, which is a member of the ginger family. It is the main biologically active phytochemical compound of Turmeric. It is extracted, concentrated, standardized and researched. Turmeric is a spice derived from the rhizomes of *Curcuma longa*, which is a member of the ginger family (Zingiberaceae) and a gold-coloured spice commonly used in the Indian subcontinent, not only for health care but also for the preservation of food and as a yellow dye for textiles. Fresh turmeric leaves are used in some regions of Indonesia as flavouring. It is called 'Indian saffron' because of its orange – yellow colour. In some languages, the names of turmeric just mean "yellow root". Curcumin has antioxidant, anti-inflammatory, antiviral and antifungal actions.

### Applications

The few broad use categories are medical use, food additives and many more. Traditionally turmeric is being used in Indian System of medicine. It has several medicinal properties like stomachic, carminative, tonic, blood purifier, vermicide and antiseptic. Curcumin has also been shown to have a marked anti-inflammatory effect. It accomplishes this by reducing histamine levels and possibly by increasing production of natural cortisone by the adrenal glands. Curcumin also protects the liver from a number of toxic compounds. Curcumin is very useful in joint related concerns, helps maintain normal cholesterol and a healthy heart, is very helpful as a digestive support, is extremely helpful in liver protection, is also used in controlling obesity and induces the flow of bile, which breaks down fats.

### Global Demand

Indian export- Around 140.17 metric ton per annum

India is one of the leading producers and exporters of Turmeric. In traditional Asian medicine, turmeric is used to treat various conditions. These value-added products enjoy excellent demand in the developed economies where

they are used as food ingredients to enhance value and aroma of many foods. Importantly, they are standardized products, hygienic and of consistent quality, also used in addition to a variety of pharmaceutical formulations. Spice Oleoresins are essentially the concentrated liquid form obtained from spices. Oleoresins are popularly used for food flavouring in the food processing industry. The demand for these derivatives is on the rise in the global market and India too is cashing on this booming market. Among the export of different spices, maximum share was from chilli (40%) followed by turmeric (11%) during 2009-2010. However, in terms of value, mint products and spice oil & oleoresins contributed 44% of the total export earnings. Global production is estimated around 11 -11.5 lakh tonnes. India contributes about 78 per cent of the world production and 60 per cent to the total trade. The increasing demand for natural products is in the pharmaceutical industry also.

There was an annual demand growth rate of five to 6% for all spices oleoresins in the world which was expected to increase further as they were becoming popular amongst the consumers the world over. It makes Curcumin one the major product to invest. Since the benefits and demand of Curcumin are immense it has an excellent market potential.

#### ***Cost Estimation:***

Capacity	:	23400 Kg/Annum, Curcumin 23400 kg/Annum, Turmeric oil 550 MT/ Annum, De-oiled turmeric powder
Plant and Machinery	:	122 Lakhs
Cost of project	:	289 Lakhs
Rate of return	:	54%
BEP	:	51%

#### **Spice (100% EOU)**

Spices constitute an important group of agricultural commodities which are virtually indispensable in the culinary art. Spices are natural products widely accepted by consumers. Spices are most important constituents of Indian food and cuisines, and are used not only for household purpose, but also in hotels, restaurants, eateries and food processing industries.

Spices are used in the variety of food preparation for making palatable taste and good appearance. It may be used some times for the preparation different drug base & natural colour. Oil from spices sometimes used for the manufacturing of different insecticides.

A spice for export purposes undergoes stringent quality checks. The basic spice processes includes cleaning & grinding. Separate the spices from any larger contaminants, such as stones, dust, leaves or sticks and then wash it with clean water until the water ceases to have any trace of dust or

dirt in it. Only portable water can be used for all cleaning purpose. The next step is grinding. Grind those spices that are going to be used soon and store them well. It also adds value to the end product. The spice's flavour may escape if not stored properly, and will result in less savory. Pack the whole spices as per the requirements in PP gunny bags. If humidity is high and the spice is whole, you can store the spice in sacks.

India is the world's largest producer and exporter of range of raw and processed spices. India leads in cumin, chili and turmeric production in the world. India is likely to emerge as a leading global spice processing hub in about 10 years spice board. India's spice exports, expected to amount to \$ 875 million in the current fiscal, will breach the \$ 1 billion mark next year. The government is also keen on increasing value-addition in spices.

The scope for this product is very bright. A new entrepreneur venturing into this project will find it very lucrative.

***Cost Estimation:***

Capacity	:	150000 Kgs./Annum
Plant & Machinery	:	11 Lakhs
Total Capital Investment	:	112 Lakhs
Rate of Return	:	49%
Break Even Point	:	39%

**Whole Spices Processing  
(Cleaning / Grinding & Packaging)**

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The scope for this product is very bright. Thus, a new entrepreneur can confidently venture into this project will find it a very lucrative.

***Cost Estimation:***

Capacity	:	105000 Kgs./Annum Black Pepper, Cumin, Coriander Chilly, Ginger, Turmeric & Fenugreek Each 50 Kgs/Day.
Plant & Machinery	:	15 Lakhs
Total Capital Investment	:	37 Lakhs
Rate of Return	:	42%
Break Even Point	:	54%

### *Information*

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- ★ One Crore is equivalent to Ten Million (10,000,000)
- ★ T.C.I. is Total Capital Investment
- ★ All costs/amount given in INR ₹
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### Reinforcement Steel Bar/Tor Bar

Steel is said to be the backbone of any national economy, because most of industries greatly depend on the use of iron and steel for structural purposes. Bridges, buildings, automobile, power plants, machine tools, engineering industries, railway, marine, irrigation all owe to steels for their infra structural facilities and input materials requirements. India has progressed well in the field of steel production in the post independence era. The level of steel consumption in a country is considered as an indicator of its height of industrialization and growth of civilization. Demand of steel bar is increasing day by day with the growth of industries and construction sector.

There is good scope for new entrants in this project.

#### *Cost Estimation:*

Capacity	:	6000 MT/Annum
Plant & Machinery	:	392 Lakhs
Cost of Project	:	675 Lakhs
Rate of Return	:	42%
Break Even Point	:	62%

### Butt Welded Carbon Steel Fitting and Steel Flanges

Butt welded steel pipe fittings are extensively used in a piping system to change direction or function which is mechanically used to the system. The main types of fittings are, various types of elbows, bends, reducers, cross and cap etc.

A pipe fitting is defined as a part used in a piping system to change direction or function, which is mechanically joined to the system. Butt joints in pipe work are normally welded by the metal arc process, but argon-arc and semi-automatic methods are used when appropriate. Pipe flanges are used as couplings to join lengths of pipe. Traditionally there have been two main types of flanges. Butt-weld i.e. weld neck for very high pressure and slip-on flanges for the medium and low pressure. However in the past few years more companies are using the slip-on variety of flanges. Even for very



high pressures. The reason for this is the high and consistent quality of steel plate, and also the cost. The most common facings machined on flanges are: Raised face, Flat face and Ring face.

The growth in power sector, oil and natural gas shipping urban water supply and water sewage disposal and chemical and petrochemical industry will result in increased demand for pipe fitting and flanges. Forge flanges/pipe fitting at high temperature/pressure will be required while at low pressure/temperature, fabricated flanges/fittings will be required such as urban water supply/sewage disposal and various industrial applications. There is quantum in power generation during 12<sup>th</sup> plan (2012-2017) by addition capacity of over 20,000 MW. Similarly in oil and gas sector and urban infrastructure, chemical and petrochemical there is faster growth which shall generate considerable demand for these items. There is a very good scope and demand for such products and new entrepreneurs should venture into this field.

***Cost Estimation:***

Capacity	: 1500 MT Steel Fittings & Flanges/Annum
Plant & Machinery	: 705 Lakhs
Cost of Project	: 1178 Lakhs
Rate of Return	: 42%
Break Even Point	: 59%

**Steel Rolling Mill**

The chief departments of a metallurgical plant operating on a complete ore-to-finished product cycle are the blast furnace, steel making and rolling departments. Almost all the steel that is produced in the steel making department passes through the rolling department; only a small portion is used for making casting and forgings. The rolling process, in which the finished product is produced, is the concluding stage of metallurgical production.

The finished product of such a plant is rolled stock of various types, designed for various purposes, such as: rails; beams; channels; angles; round, square or strip steel; special-purpose shapes, plate and sheet; tubes, etc. The initial material supplied to the rolling mill is the ingot which may be either square or rectangular in cross-section. In certain cases round ingots are employed (in the production of tubes, wheels and types).

The rolling process in a modern metallurgical plant comprises two stages:

- (1) Rolling the ingot into the semifinished product and
- (2) Rolling the semifinished into the finished product.

Under the dispensations of the government's Industrial Policy of the post-liberalisation era, four steps changed the direction of the steel industry in India. These were (i) freedom to set up integrated steel plants in the private sector; (ii) placing imports of steel under OGL (open general licence); (iii)

reduction of import duties on both steel and scrap; and (iv) decontrol of domestic prices.

The comparative advantage of cheap and high quality iron ore and manganese, has been somewhat set off by the limited accessibility of the steel industry to the supply of coking coal. The adoption of the sponge iron route by the private sector integrated plants helped in circumventing the constraint, and at the same time, ushered in a technological revolution in the industry. As a result, India has come to enjoy a cost advantage compared to most countries.

The domestic demand is based on the per capita consumption in the urban sector increasing from 77 kg to 165 kg in 2019-20 at an annual growth of 5%. Likewise the per capita consumption in rural areas was expected to rise from 2 kg per annum to 4 kg by the terminal year (a CAGR of 4.4%). India has one of the lowest consumption rate in the world - around 33 kg per person to China's 200 kg, and South Korea's 900 kg. The thrust to an increased growth of over 7% is expected to be realised by a 13% annual increase in exports.

To achieve the planned target on the basis of proposed investments, the Indian steel sector would require an estimated additional workforce of 136,000 to achieve the anticipated steel production of 68 mn tonnes by 2011-12. It was anticipated by the government. That India would reach a capacity of 124 mn tonne by 2012. Extending the horizon further, India is slated to achieve a capacity of over 240 mn tonnes per year by 2020. China's present capacity stands at 349 million tonnes. In this context, the steel industry's target of 110 mn tonnes by 2019-20 may be considered modest.

There is a very good scope in this sector and new entrepreneurs should venture into this field.

***Cost Estimation:***

Capacity	:	Hot Rolled Rods 30000 MT/Annum Tor Steel 15000 MT/Annum Cold Rolled Steel 15000 MT/Annum
Plant & Machinery	:	429 Lakhs
Cost of Project	:	1145 Lakhs
Rate of Return	:	45%
Break Even Point	:	51%

**Cold Rolled Stainless Steel Plant from HR to CR**

Stainless steel today is an ideal base material for a host of commercial applications due to its resistance to corrosion and staining, low maintenance, relatively low cost, and familiar luster. Its application is increasing day by day. Stainless steel being skin-friendly, its uses in day to day life has been

expanding rapidly. Consumers have accepted jewellery made of stainless steel widely. The usage of stainless steel is expanding rapidly in various fields like houseware, hardware, furniture, machinery, pipe-wire-coil-sheet, railway vendor, architectural building and construction, sanitary equipment, dairy, automotive, ferro alloys and allied. Steel industry in India is on an upswing because of the strong global and domestic demand. India's rapid economic growth and soaring demand by sectors like infrastructure, real estate and automobiles at home and abroad, has put Indian steel industry on the global map. According to the latest report by International Iron & Steel Institute (IISI) India is the seventh largest steel producer in the world.

The Indian Steel Industry is almost 100 years old now. Till 1990, the Indian steel industry operated under a regulatory environment with insulated markets and large scale capacities reserved for the public sector. Production and prices were determined and regulated by the Govt. While SAIL & Tata Steels were the main producers, the latter being the private player. Year 1992 saw the onset of liberalization and the Indian economy was opened to the world. Indian Steel sector also witnessed the entry of several domestic private players and large private investments flowed into the sector to add fresh capacities. In India, the major producer of stainless steel products are M/s. Jindal Stainless Ltd. which constitutes about 46% of the total stainless steel production in India and it is in first tenth position globally. The annual production capacity of JSL is now enhanced from 5.00 lacs to 7.20 lacs tons/annum of HR/CR coils/sheets/strips etc. The other major producer of stainless steel products is SAIL which produces 186000 tons/annum. SAIL is also planning to expand/increase the annual capacities to 3,64,000 tons/annum. Also M/s. Chopra Group of Companies have production capacities of 40,000 tons/annum at Jodhpur, Rajasthan. The other companies, which also manufacture stainless steel products, are such as ISPAT, ESSAR, Tata Steels etc.

The global size of stainless steel is approximately 28 million tonne, while the domestic size of stainless steel is 2 million tonne in India. India is set to become the third largest stainless market in the world by the year 2014. Backed by growing demand from consumer sector, India's stainless steel production is expected to rise noticeably by about 8 per cent in next five years. According to Indian Stainless Development Organisation (ISDO), the consumption of stainless steel in India is 23-24 lakh tonne per year, while the production stood at 19 lakh tonne in 2008-09, which is estimated to surge to 20-22 lakh tonne in 2009-10 and 25 lakh tonne within the next five years. By 2014, the total world market is expected to be over 39 million tonne. The benefit of stainless steel is quite evident and now there is increasing awareness of the product. Stainless steel is the material of the new millennium due to its newer application in various industrial segments and therefore steel age future looks very bright in times to come.

***Cost Estimation:***

Capacity	:	3750 MT/Annum
Plant & Machinery	:	899 Lakhs
Cost of Project	:	1458 Lakhs
Rate of Return	:	42%
Break Even Point	:	54%

**Fusion Bonded Epoxy Coated TMT Rebars**

Steel is one such material that has played an important role in the development of mankind in the last century. Today, it is difficult to imagine a world without steel. Steel has become vital to our everyday life. It is at the root of the quality of life that each of us enjoy today, helping to shelter us, to feed us and to facilitate both our working and leisure activities.

Thermo Mechanical Treatment (TMT) Process for reinforcement bars is opening up new vistas in composite RCC, the re-enforcing steel is the costliest constituent. Rebars are rods of hot rolled carbon steel made to various specifications, which are essential components for construction works. Fusion bonded epoxy coating, also known as fusion bond epoxy powder coating and commonly referred to as FBE coating, is an epoxy based powder.

Fusion Bonded Epoxy Coated TMT Rebars is an innovated and improved TMT bar. It is TMT bar is resistance to corrosion and other degradation process. It is widely used in building construction and other civil works, related constructions. FBEC is used to protect reinforcing Steel in concrete in the most adverse environments that are prove to corrosion over the last 35 years in all over the world and for around 20 years in India.

Global Steel Production has now crossed the 1 billion tonne mark the back of recovery in the global economy. Global steel trade has now increased to 350 MT. The steel industry in India has always been on the ascent, owing to the abundant availability of raw materials like iron ore, limestone and coal, besides relatively cheap labour, which is a major cost advantage. It is note worthy to mention that India is the sixth largest producer of iron ore and the tenth largest producer of crude. National Steel Policy 2005 envisages steel consumption in the country to go up from 37 million tones presently to 110 million tones by 2020. Steel is a core sector industry and the demand for steel affects the economy of the country.

So, there is very good domestic as well as export market for FBEC TMT Rebars. Now entrepreneurs can well venture into this field.

***Cost Estimation:***

Capacity	:	35000 MT/Annum
Plant & Machinery	:	408 Lakhs
Cost of Project	:	1543 Lakhs
Rate of Return	:	46%
Break Even Point	:	48%

### **TMT Bars (Sariya) Project**

Thermo Mechanical Treatment (TMT) process for reinforcement bars is opening up new vistas in composite RCC, the re-enforcing steel is the costliest constituent (30 to 40% Per Cu. M. of concrete). This cost can be substantially reduced by using higher grades of steel re-enforcing bars. The higher yield strength of re-bars lowers the steel requirement, which results in reduced cost of construction. In India, high strength re-bars of yield strength up to 500 N/sq. mm. are produced either by cold twisting or micro-alloying or a combination of both which adds considerably to the cost of the re-enforcement bars.

During the last 30 years, high strength cold twisted deformed bars with yield strength of 415 MPa conforming to IS:1786/85 are widely produced and marketed in our country. These cold twisted bars, though in extensive use at present, continue to have inherent problem of inferior ductility, weld-ability and increased rate of corrosion. Production of re-bars by the addition of micro-alloys gives the desired results of high strengths but at a cost, which is prohibitive.

The need for reduction in the steel used for concrete re-enforcement has prompted most countries to switch to re-bars of higher yield strengths of 500 and 550 MPa. The need for cutting down the cost of production of high strength re-bars has initiated the involvement of a more economical and competitive process – the Thermo Mechanical Treatment (TMT) Process. The use of Thermo Mechanical Treatment process has not only helped produce re-bars of high yield strength but also having superior ductility, weld-ability, bend-ability, better corrosion resistance and thermal resistance creating a revolution in re-enforcement engineering. The TMT bars are widely used in construction works such as high rise building, industrial structures, flyovers and bridges etc.

The Indian iron and steel industry has come to occupy a dominant position in the socio-economic development of the country and it is certainly a matter of pride that India is the 7<sup>th</sup> largest crude steel-producing nation in the world. After having gone through the highs and lows of business cycles over time, today the Indian steel industry is on the threshold of a major change as it gears up to give substance to an expansion plan that is ambitious by any standard. Joining forces with the 'Main Producers' are the 'Secondary Producers' as well, whose emergence in the post-liberalized decade in the Indian steel scene had been initially modest but over the years, they have made a significant contribution to the growth of the domestic iron and steel industry, in terms of spread, capacity, production and commodity basket, necessitating thereby, a fresh look at the segment, traditionally labeled as the 'Secondary' Producers, under the Indian context. Steel production in India got a momentum with the announcement of the Industrial Policy Resolution of 1956 when three SAIL plants were set up in the public sector in the late 1950s

and the fourth in early 1970. These plants along with IISCO (now, a part of SAIL), VISL and TISCO (now Tata Steel Ltd) were the only integrated steel producers till the eighties. Vizag Steel plant/RINL came into production in the early nineties. The 70s saw the emergence of the Secondary sector – small scale steel producers who opted for the scrap-DRI based electric arc furnace/ induction furnace routes – to meet primarily local demand. The semi finished ingots/billets produced by this segment, in turn led to the commissioning of a large number of re-rolling units to convert the semi finished steel into bars and rods, to be used mainly by the construction industry.

Moving over the Re-rolling segment, challenges include facing the market downs, specially prices and operational factors like high energy consumption. Prospect for future growth may be considered bright, given the pace and scale of infrastructure / construction activities. Such prospects are captured in the projections for the 11<sup>th</sup> Five Year Plan of the Government of India, which indicates that share of Secondary Producers in total crude steel production would rise from the present below-50% mark to 53% at the end-of the plan period, as the Secondary sector consolidates their position further. As the steel industry, including the foreign steel giants setting up steel plants in India, prepares to launch their dream projects, the future of steel in India is awaits a new chapter to be written – a phase which would in all likelihood would witness the Secondary Steel sector further increase their dominance and criticality in the overall operations of the Indian iron and steel industry. If we were to pause for a moment to think about the growth of human civilization, we would find that the pace of social and economic growth has been closely linked to the proficiency with which people have been able to use of shape materials.

Steel is one of the critical inputs required to sustain the growth of the economy. In fact it is the basic input for all kinds of economic activity. With the sustained growth of the Indian economy, there has also been a remarkable growth of the Steel Industry. The growth of infrastructures, roads and bridges, civil construction projects, and modern town ship complexes will ensure continued demand of TMT bars.

### **Steel Project (Iron, Sponge Iron to Billet to Rods)**

Steel is the most widely used material in a large variety of applications both simple and sophisticated. Steel is produced through two process routes; the ore based blast furnace – LD converter route, scrap, or DRI based electric arc flame route.

Sponge iron is a substitute for scrap in the electric arc furnace, which can be easily manufactured from indigenously available raw materials at very competitive price.



Billet refers to a cast semi finished products. It is also referred to as ingot, particularly for smaller sizes. A billet is typically cast to a rectangular, hexagonal or round cross section compatible with secondary processing e.g. forming or milling. It can be produced either as coil or cut lengths. Billets are collectively known as bar stock.

The liberalization of industrial policy and other initiatives taken by the government have given a definite impetus for entry, participation and growth of the private sector in the steel industry. While the existing units are being expanded, a large number of new steel plants have also come up in different parts of the country based on modern, cost effective, state-of-the-art technologies.

At present, total steelmaking capacity is over 34 million tonnes in India, the 8<sup>th</sup> largest producer of steel in the world, has to its credit, the capability to produce a variety of grades and that too, of international quality standards. As per the ratings of the prestigious "world steel Dynamics"; Indian HR products are classified in the Tier II category quality products – a major reason behind their acceptance in the world market.

Although the Indian steel industry enjoyed the advantage of cheap and high quality iron ore and manganese, its limited accessibility to the supply of coking coal was a constraint. The adoption of the sponge iron route by the emerging private sector integrated plants helped not only in circumventing the constraint, but also witnessed a technological revolution of sorts by the industry. As a result, India enjoys a cost advantage compared to some countries.

So there is very good domestic as well as export market for steel project. New entrepreneurs can well venture into this field.

***Cost Estimation:***

Capacity	:	1020000 MT/Annum
		Steel Round Section
Plant & Machinery	:	987 Crores
Cost of Project	:	1175 Crores
Rate of Return	:	46%
Break Even Point	:	54%

## Chapter 62

### TAMARIND AND TAMARIND BASED PRODUCTS

#### Tamarind Pulp from Tamarind

Tamarind is widely used in vegetable preparation or producing sour taste in different kind of foods, snacks etc. It is generally used as paste forms or water extracts and produces good sour taste. Generally it contains tartaric acid, red colour pigment, fruit sugars, minerals etc. It is largely available in India, Africa, Pakistan etc and now there is about 5 lakh tones of tamarind available in India. Nowadays, in India there is very good prosperity and scope of availability of market for tamarind base products. There is also good export possibility of the tamarind paste. Generally special type of stainless steel made plant and machineries are use for the manufacturing of these products. As a whole, this is a good food base project and there is scope for new entrepreneur to enter in this market.

#### *Cost Estimation:*

Plant Capacity	: 5.00 MT/Day
Plant & Machinery	: Rs. 48 Lakhs
W. Cap. For 3 Months	: Rs. 118 Lakhs
Total Capital Investment	: Rs. 265 Lakhs
Rate of Return	: 25.88 %
Break Even Point	: 55.74 %

#### Corrugated Carton Boxes Gum Powder (Tamarind Kernel Powder Base)

It is basically gum powder made from tamarind kernel, dimethyl hydantoin formaldehyde, polyvenyl alcohol all the required raw material and machineries are easily available in India. Few private organizations are engaged in the manufacturing of corrugation gum powder. Production data for the product is not available, but it can be assumed that the demand will be increased in proportion of the total carton boxes production. Any new entrepreneur may enter in to this field will be successful.

***Cost Estimation:***

Plant Capacity	: 1MT/Day
Plant & Machinery	: Rs.7.00 Lakhs
Working Capital for 3 Months	: Rs.14.00 Lakhs
Total Capital Investment	: Rs. 24 Lakhs
Rate of Return	: 27.23%
Break Event Point	: 52.93%

**Tamarind Based Products**

India is the major producer of tamarind in the world. In the tropic zone, tamarind is used in many dishes or traditional drinks, but the commercial cultivation of the crop was initiated only recently. Every part of the tree is useful, specially the fruit. The sweetish acidic pulp of the fruit is the product of commerce. Recently, much attention is given to the various constituents in tamarind, which find use in both medicinal and industrial field. The ripe tamarind fruit can be separated into pulp and kernel, both having diversified uses in medicine and industry. Tamarind products possess good export potential. Even though, traditional processing is widespread, its commercial uses are unknown and underdeveloped. The growing demand for tamarind and its products should be encouraged at the farmers level, by developing high yielding short term varieties and effective breeding techniques. There is no doubt that tamarind has got a glorious future ahead, provided sufficient attention.

***Cost Estimation:***

Plant Capacity	: 3200 Kgs./Day
Plant & M/c	: Rs. 112 Lakhs
W.C. for 3 Months	: Rs. 230 Lakhs
Total Capital Investment	: Rs. 494 Lakhs
Rate of Return	: 31.52%
Break Even Point	: 53.08%

**Extraction of Oil from Tamarind Seeds**

Tamarind is one of the best vegetable products which is largely used by the domestic people as well as in the hotels, dhabas and restaurants for the food preparation as sour taste. This has very good palatable sour taste. After extraction of pulps from tamarind there is bye product of tamarind seed. Tamarind seed is largely used for the manufacturing of low cost tamarind seed flour. Tamarind is produced in the tempered zone of India, Pakistan, Africa and few other parts of the world. It is not available in the European countries. There is abundant amount of tamarind available in India, but there

are very rare uses of tamarind as basic industrial raw material. Manufacturing of tamarind seed oil will be commercial exploitation of tamarind seed. It has very good scope in India as well as it can be exported for the pharmaceutical base products. 7-10% oil is available in the tamarind seed. It can be extracted by using hexane as solvent for extraction of tamarind seed oil. Required plant machineries made by mild steel plate base extractor distillation unit and solvent storage tank etc. Plant machineries and raw materials are available indigenously. There is about 30% vegetable oil storage in our country which meet up by importing of vegetable oil. There is good market potentiality of the tamarind seed oil. There are possibilities of air pollution in this plant. It is necessary to take proper step to neutralize the environmental pollution. As a whole this is good project along with other vegetable oil.

Tamarind seed oil can be used directly in the paint industry. The oleoresin from Tamarind oil has very good pharmaceutical end use and it is high valued product. The seed oil can also be used as vegetable oil as food grade after refining of the oil and also can be used for manufacturing of high valued organic fatty acids.

There are very few prominent manufacturers of tamarind oil. It can be truly said that there is no manufacturer of this type of oil. Few are manufacturing in their own extraction plant with other oils. Tamarind seed is available annually in India about 2 lakh tonnes as waste of tamarind pulp processing plant. There is no as such data available of only tamarind oil. It is new line of action, which has good potentiality in near future like rice bran oil. As in India there is about 30% of vegetable oil demand is full filled by import only. Hence it can be concluded that new entrepreneur entering into this field will be successful.

***Cost Estimation:***

Capacity	:	3000 MT/Annum (Deoiled Tamarind Seed 112 to 115 MT/Day
Plant and Machinery	:	60 Lakhs
Total Capital Investment	:	1310 Lakhs
Rate of Return	:	52%
Break Even Point	:	23%

### **Textile Weaving Mill**

The textile industry occupies a leading position in the hierarchy of the Indian manufacturing industry. It has witnessed several new directions in the era of liberalisation. While textile exports are increasing and India has become the largest exporter in world trade in cotton yarn and is an important player of readymade garments, country's international textile trade constitutes a mere 3% of the total world textile trade. Several mills have opted for modernization and expansion and are going in for export-oriented units (EOUs) focused on production of cotton yarn. It has passed through cyclical oscillations and at present, it is witnessing a recovery after a downturn.

Of the entire industry volume of about 5 mn tonnes, polyester and polyester filament yarn account for about 1.7 mn tonnes, and acrylic, nylon, and viscose taken together for 300,000 tonnes. The balance is represented by cotton textiles.

A majority - some three fourths - of the textile mills are in the private sector. A few of the units are in the co-operative sector with the public sector (Central and State) accounting for about 15% of the total.

The textile industry is classified into (i) textile mills comprising composite and spinning mills in the organised segment, (ii) small powerloom and handloom units in the decentralised segment, (iii) khadi-based units, (iv) manmade and synthetic fibre and spinning units, v) knitting units, and (vi) made-ups (garments). Besides, the industry has a large number of small units scattered all over the country which are engaged in processing, dyeing and printing of yarn, fabrics and for conversion. The processing units include sizing, desizing, kiering, bleaching, mercerizing, dyeing, printing and finishing.

There are a number of large mills which could be termed lead players. The major composite mills include the industry big names like Century, Bombay Dyeing, Mafatlals, Arvind Mills, Vardhaman group, Nahar group. A few developments may be mentioned as trend setters.

***Cost Estimation:***

Capacity	:	60000 Mtrs./Day
Plant & Machinery	:	258 Lakhs
Total Capital Investment	:	1886 Lakhs
Rate of Return	:	56%
Break Even Point	:	34%

**Undergarments (Men & Women)**

Undergarments or underwear are clothes worn under other clothes, often next to the skin. They keep outer garments from being soiled by bodily secretions and discharges, shape the body and provide support for parts of it. Undergarments commonly worn by women include bra and panties, while men often wear briefs, boxer briefs are boxer shorts.

India is one of the countries, which are referred to as BRIC group. At the present moment India is considered to be on the second position in the world by potential volume of consumption. Large population of this country makes it a promising sales area, as well as significant reserve of human resources for world economy. There are good domestic and export market of Indian garments. So venture in to this project will be profitable.

***Cost Estimation:***

Capacity	:	630000 Pcs./Annum (Women Undergarment) 420000 Pcs./Annum (Men Undergarment)
Plant & Machinery	:	18 Lakhs
Cost of Project	:	101 Lakhs
Rate of Return	:	41%
Break Even Point	:	76%

**Readymade Garments for Children & Teenage**

Readymade garments are a part and parcel of our daily life. Clothes are an epitome of a culture. People in different parts of the world have their own styles of dressing which symbolize their culture and status. The Readymade garments industry is increasing day by day due to changes of fashion in day to day life. The textile industry including readymade garments occupies a unique position in the Indian economy. Its predominant presence in the Indian economy is manifested in terms of its significant contribution to the industrial production, employment generation and foreign exchange earnings. The readymade garment industry in India owes its existence to the emergence of a highly profitable market for exports. Ready-made garments account for approximately 45% of India's total textile exports. It has immense potential for employment generation particularly in the rural and remote areas of the country



on account of its close linkage with agriculture. They represent value added and less import sub sector. In the recent years, however, the domestic demand has also been growing rapidly.

The readymade garments industry in India owes its existence to the emergence of a highly profitable market for exports. The changes in the life style since the onset of the liberalization era, and given the base of the industry for the overseas market, Indian garments industry have taken big strides. The entry of the Indian and global fashion designers has stimulated the market further. The garment segment categorises itself into many sub-segments: formal wear and casual wear; women's dresses, men's and kid wear, suits, trousers, jackets, shirts, sportswear, knitwear. The future of export of readymade garment is very bright and promising. With the rising tailoring costs and relatively low prices of standardized products, the Indian consumer is increasingly taking to readymade. In the past, the readymades market was confined mainly to baby dresses and small manila-shirts and dress shirts. Now it has extended to trousers, suits, and lady dresses and, of course, fashion garments for men and women. Readymade of specific brands have become not only a status symbol; these have brought a more contemporary style in offices as much as in social circles. Franchised boutiques have been established as tools for brand and image building.

The future of export of readymade garment is very bright. There are tremendous possibilities for further growth in export of readymade garments. The Indian readymade garment industry has many advantages over its counterparts in other countries. India has second largest labour force in the world to feed labour intensive garment industry. Its basic raw materials namely fabric is mainly indigenous.

In the coming years the apparel industry given the vast labour force in the country and the cotton edge can expand its export base considerably. The main asset of Indian garment industry is our skilled labour capable of creating the latest designs and fashions, unbeatable world over.

The future of readymade garment is very bright and promising. New entrepreneurs should venture into this sector.

***Cost Estimation:***

Capacity	:	1200 Pcs./Day Shirt, T-Shirts Jeans, Trousers, Top & Salwar
Plant & Machinery	:	41 Lakhs
Total Capital Investment	:	289 Lakhs
Rate of Return	:	47%
Break Even Point	:	44%

## Chapter 64

### TOWNSHIP AND RESORT

#### Township

The importance of infrastructure for sustained economic development is well recognized in a country. India will be a high growth economy over the next decade. India's infrastructure spending at the present accounts for just 4 per cent of GDP as compared to china's 9 percent.

In recent times, with the rapidly exploding population the need for housing and the increasingly crowded cities led to the creation of suburbs. Townships are now developed to end the housing shortage, and provide a better standard of living to all sections of the society. Staying in townships gives the residents a feeling of living in the countryside, with all the benefits of the city. The township format, although it's been around for a while, is still not a unified one across the country. This lack of common definition means that anything from a development of 25 acres to 2,500 acres is being touted as a township. However, individual state governments and planning authorities have specified key prerequisites for a project to be called a township. They are basically self-sustaining in nature. The size of townships varies but historically a township is an area of land that is 6 acres square. Developers across the country have re-discovered the township model and are going all out to develop little cities on the outskirts of metros. According to a DTZ study, townships are mushrooming in urban centres across India with Bangalore, Mumbai and Delhi witnessing the maximum activity.

One of the biggest advantages of investing in townships projects is that the cost of entry is low compared to investing in the city. Most townships projects are coming up at a distance from the city core and this gives the developer an advantage of lower land cost. These are viewed as a low-risk investment due to its diversification and low entry cost with larger upside potential.

The residential sector in India has undergone a far-reaching metamorphosis in the last decade. After years of unplanned and haphazard development, the sector is now marked by enhanced product offering, heightened investment including foreign capital, and augmentation of the national footprint of some prominent Indian developers. Modern apartments and villa and township projects have come up across the country and new city master

plans have been drawn to include a number of suburban and peripheral locations within the city's folds.

The Indian economy has been growing at an average rate of 8.8% in the last four fiscal years, with the 2008-09 growth rate clocking an impressive 9.8%. This stellar growth, augmented by the unmatched fundamentals that the country enjoys, has given strong impetus to the real estate sector in India. The residential segment leads the growth trajectory—nearly 75-80% of the total real estate space development across India is in the residential segment. Rapid urbanization, increase in number of households, rising income levels, and easy availability of housing finance are among the chief reasons cited for this trend.

There is a very good opportunity and scope for investments in such projects. New entrepreneurs should venture into this field.

***Cost Estimation:***

Capacity	:	Villa with Private Swimming Pool 280 Nos. Shopping Arcade 150 Nos. Shop EWS Houses 30 Nos.
Total Capital Investment	:	3440000 Lakhs
Rate of Return	:	28%
Break Even Point	:	40%

**Holiday Resort (Three Star Grade)**

Tourism as an industry has been flourishing and growing since time immemorial, but it has been in the last few decades that specific attention has started to be given to this smokeless industry. Tourism has emerged as an important as well as organized industry which scattered its benefits over large segments of the population.

Destination resort is a resort that contains, in and of itself, the necessary guest attraction capabilities—that is to say that a destination resort does not need to be near a destination (town, historic site, theme park, or other) to attract its public. Consequently, another characteristic of a destination resort is that it offers food, drink, lodging, sports, entertainment, and shopping within the facility so that guests have no need to leave the facility throughout their stay. Commonly these facilities are of higher quality than would be expected if one were to stay at a hotel or eat in a town's restaurants.

In India there is a very good gap of availability of holiday resorts in different place of India. There is good scope of holiday resorts due to demand of more and more hotel rooms to accommodate the foreign as well as domestic tourists. Arrival of foreign tourist has increased by 8-10%.

India is seen as a potential country for such developments and awareness is the requisite to start the process. The vacation ownership is growing at

a compound annual growth rate of 20 per cent for the last three to four years and has become the reason for resort developments in India. The market for timeshare models is huge and more importantly, domestic traffic is adopting the lifestyle that supports the timeshare model. India is in an embryonic stage of development in innovative product models for vacation ownership real estate developments.

***Cost Estimation:***

Capacity	:	Holiday Resort With 27 Rooms (3 Cottages, 16 Deluxe & 8 Suites)
Plant & Machinery	:	631 Lakhs
Total Capital Investment	:	945 Lakhs
Rate of Return	:	45%
Break Even Point	:	35%

***Information***

- ★ One Lac / Lakh / Lakhs is equivalent to one hundred thousand (100,000)
- ★ One Crore is equivalent to Ten Million (10,000,000)
- ★ T.C.I. is Total Capital Investment
- ★ All costs/amount given in INR ₹
- ★ NPCS can provide customized Detailed Project Report on all the projects
- ★ Visit us at: [www.niir.org](http://www.niir.org) Email : [info@niir.org](mailto:info@niir.org)

**E-Waste Recycling Plant  
(Electronic waste, e-waste, e-scrap, or Waste  
Electrical and Electronic Equipment (WEEE))**

Electronic waste, e-waste, e-scrap, or Waste Electrical and Electronic Equipment (WEEE) are a loose category of surplus, obsolete, broken, or discarded electrical or electronic devices. The processing of electronic waste in developing countries is causing serious health and pollution problems due to lack of containment, as do unprotected land filling (due to leaching) and incineration. The Basel Convention and regulation by the European Union and United States aim to reduce these problems. Reuse and recycling of these e-wastes are promoted as alternatives to disposal as trash.

There was unanimity that electronic waste containing substances like lead, cadmium, mercury, polyvinyl chloride (PVC) have immense potential to cause enormous harm to human health and environment, if not disposed properly since the exact prescriptions for its disposal and safeguard were inadequate. Thus, the imperative need for early formulation of a holistic E-waste legislation which will eventually lead to enabling policy. It was consequently agreed that such a policy must appropriately reflect the concerns of various stakeholders, besides the views of practitioners both in the organized and unorganized sector. European countries have taken a systematic step towards the handling disposal and recycling of e-waste. There are several plants established for this particular purpose where large amount of electronic waste are recycled using the best technologies. A new trend in recycling is reuse of these waste contents. Apart from these new technologies; screening, reuse, granulating, refining, conditioning are also important processes in recycling.

With the extensive use of computers and electronic equipments, people are dumping old electronic goods for new ones; the amount of E-Waste generated has been steadily increasing. At present Bangalore alone generates about 8000 tonnes of computer waste annually and in the absence of proper disposal, they find their way to scrap dealers. Electronic waste or e-waste is one of the rapidly growing environmental problems of the world. In India,



the electronic waste management assumes greater significance not only due to the generation of our own waste but also dumping of e-waste i.e computer waste from the developed countries. The scope for e-waste recycling project is very good. New entrepreneurs' venturing into this field will be successful.

***Cost Estimation:***

Capacity	:	Monitor 10 Pcs. Per Day. Plastic Dana 5.33 MT Per Day E-Waste Recycling Plant Copper Wire Scrap 9 Kgs/Day Glass Scrap From Crt 270 Kgs/Day Other Metal 800 Kgs Per Day
Plant & Machinery	:	51 Lakhs
Total Capital Investment	:	196 Lakhs (W/C – 1 Month)
Rate of Return	:	47%
Break Even Point	:	40%

**Carbon Black from Waste Tyres  
(Waste Tyre Prolysis)**

With the phenomenal increase in number of automobiles in India during recent years the demand of tyres as original equipment and as replacement has also increased. As every new tyre produced is destined to go to waste stream for disposal/recycling/reclamation, despite its passage through retreading process, the number of used tyres being discarded is going to increase significantly. Timely action regarding recycling of used tyres is necessary in view to solve the problem of disposal of used tyres keeping in view the increasing cost of raw material, resource constraints and environmental problems including fire and health hazards associated with the stockpiles of the used tyres. The world generates about 1.5 billion waste tyres annually, 40 percent of them in emerging markets such as China, India, South America, Southeast Asia, South Africa and Eastern Europe. All Pyrolysis plant is renewable energy generation system. Pyrolysis plants are designed to generate quality fuel from polymer waste.

Pyrolysis has several advantages over other alternative tyre recycling methods. No toxic substances are emitted, and various commercial applications for all of the products obtained are possible. Carbon Black is the main product recycled by Pyrolysis technology. The amount of recycled carbon black is 30% to 35% (depending on the type of tyres) of the total amount of scrap tyres recycled in the system.

Carbon black is used as raw material or main ingredient in many industries and the chemical structure of carbon black strengthens, lengthens the endurance, and improves the coloring features of the materials. Carbon black produced by Pyrolysis process is more economical compared to carbon



black produced primarily from petroleum and is more price-efficient to be used as an ingredient in the various industries. The profitability of a scrap tyre pyrolysis plant is, of course, process specific. The larger the plant capacity, the higher is the profitability.

There is a very good scope and market potential for this product and new entrepreneurs should venture into this field.

***Cost Estimation:***

Capacity	:	Carbon Black 10500 MT/Annum, Fuel Oil 1200 MT/Annum Steel Wire 360 MT/Annum)
Plant & Machinery	:	266 Lakhs
Cost of Project	:	374 Lakhs
Rate of Return	:	41%
Break Even Point	:	46%

**Waste Tyre Pyrolysis**

Waste tyre pyrolysis renewable technology has set new standard in renewable energy that includes using of waste tyres as a raw material and producing green fuel oil, carbon black, steel and gas. With global warming and utilization of rubber, it has now become necessary to recycle the waste and convert it in fuel oil in such a way that it is environment friendly. This is an unique technology which can change the energy market scenario in a big way. The history of tyre pyrolysis projects to date indicates that the problems blocking them have been technical and economic. These include the problems of upgrading the carbon black by-product while keeping down the operating cost of the process and the capital cost of the plant. Recently, there has been a technical advance in char upgrading which have helped tyre pyrolysis economically feasible.

Pyrolysis is the decomposition of organic compounds under oxygen free (anaerobic) atmosphere that produces gas, oil, carbon black and steel. Efficient industrial Pyrolysis is a process to treat the rubber and industrial plastic wastage as well. As a result of pyrolysis of wastage tyres one obtains, fuel oil (40% to 45%), carbon black (30% to 35%), steel wires (10% to 15%), and gas (10% to 12%). The main oil product produced is wide used for industrial and commercial purposes. The oil has 40% to 45% of the amount of recycled scrap tyres, which will be carried with licensed tanker trucks. Carbon black produced by Pyrolysis process (CBp) is more economical compared to carbon black produced primarily from petroleum and is more price-efficient to be used as an ingredient in the industries.

Tyres should be utilized to minimize environmental impact and maximize conservation of natural resources. A small unit for tyre pyrolysis can cost from Rs 4 Crores to Rs 5.0 Crores depending on the capacity of the unit.

This capital cost of investment will increase as the capacity of the unit increases. The management of scrap tyres has become a growing problem in recent years. But the pyrolysis technology has a great potential for using a major portion of scrap tyres generated each year, and actually reducing the tyre stockpiles that is in other words to convert waste stream of tyres into marketable products. Waste tyre pyrolysis has indeed identified existing and potential source reduction and utilization methods which will be effective in solving the tyre problem in the coming years.

***Cost Estimation:***

Capacity	:	3000 MT Waste Tyre/Annum
Plant & Machinery	:	266 Lakhs
Cost of Project	:	374 Lakhs
Rate of Return	:	41%
Break Even Point	:	46%

**Kraft Paper from Waste Cartons**

Kraft Paper, Brown paper or Wrapping paper is made from variety of raw materials, e.g. bagasse, ground wood, straw, waste paper, in various combination or alone, waste carton boxes etc. 'Kraft' mean strength and that is why its name. It is leading paper for wrapping heavy bundles. After corrugation it is used in many types of packaging and it is an important packaging material.

Kraft paper is made from waste paper or discarded carton boxes, which are found abundantly all over the country. The main concentrations of the waste paper are big cities where consumption of paper and its allied products are rated high. Government offices and education and research institutions are the main producers of waste paper, outdated new papers and various types of magazines also add, upto some extent to the generation of waste paper.

Kraft paper is extensively used for wrapping purpose, viz. wrapping, paper bags, paper cone, corrugated sheets etc. These papers are useful for paper bags; the high gloss of one side makes it easier to print and the roughness of the other provides a key for the adhesive used. Being a strong paper, it finds its wider applications in wrapping heavy bundles.

The world consumption of paper and paperboard is estimated at over 275 mn tonnes a year. It is constituted broadly 30% cultural papers, 14% of newsprint, and the balance of Kraft and packaging paper. The Indian paper industry is one of the traditional industries of India consisting of over 500 units with an installed capacity of around 5 mn tpa.

The demand for Kraft Paper is increasing rapidly. So, there is good scope for new entrants.

***Cost Estimation:***

Capacity	: 100 MT/Day
Plant & Machinery	: 164 Lakhs
Cost of Project	: 1500 Lakhs
Rate of Return	: 48%
Break Even Point	: 30%

**Furfural from Bagasse & Corncobs**

Furfural is produced from agricultural waste biomass that contain pentosans, which are aldose to sugars, composed of small rings formed from short five-member chains, that constitute a class of complex carbohydrates, present in cellulose of many woody plants such as corn cobs, sugar cane bagasse, rice and oat hulls etc. Furfural is a clear, colourless motile liquid with a characteristic 'almond-benzaldehyde' odour.

Any material containing pentosans can be used for the production of furfural. Technically furfural is produced by acid hydrolysis of the pentosan contained in woody biomass. Furfural is the only organic compound derived from biomass that can replace the crude oil based organics used in industry.

Furfural is used as a solvent in petrochemical refining to extract dienes from other hydrocarbons. Furfural, as well as its derivative furfuryl alcohol, can be used together with phenol, acetone, or urea to make solid resins. Furfural can be used for the production of lubricants; specialist adhesives and plastics; and nylons. It is the starting material for cycling shorts and many more.

The demand for furfural and furfuryl alcohol in the international market will maintain stable growth for the next few years. Due to problems in environmental impact and cost, the output of furfural in advanced countries such as the United States and European countries will decline further owing to the relatively low production cost of furfuryl alcohol in India. Expanded production of downstream products can remarkably increase the added value of India's furfural and furfuryl alcohol industrial chain. The production of THF (tetrahydrofuran) and PTMEG (polytetramethylene ether glycol) using furfural as raw material is an important way to increase the added value and is worth great attention from furfural producers.

Production of furfural and furfuryl alcohol is projected to increase at an average annual rate of 5% provided no shortage of raw material (corn cobs) is experienced. China is the only major region where increased furfural production is expected in the next five years.

There is a good scope to venture into this field for new entrepreneurs.

***Cost Estimation:***

Capacity	:	1200 MT/Annum
Plant & Machinery	:	119 Lakhs
Cost of Project	:	411 Lakhs
Rate of Return	:	41%
Break Even Point	:	55%

**Plastic Granules from Waste**

Plastic is a very common material that is now widely used by everybody in this world. Plastic is used in many ways as it is light weight and compact. The maintenance that is required is very less. Common plastic items that are used are bags, bottles, containers and food packages. A plastic is any one of a large and varied group of materials, which consists of essential ingredient combinations of carbon with oxygen, hydrogen, nitrogen and other organic and inorganic elements. While solid in the finished state, at some stage in its manufacture it has been or can be formed into various shapes by flow-usually through the application singly or together of heat and pressure. They play an important role in the economy of all industrially advanced countries.

Though plastic is a very useful material that is flexible, robust and rigid they become waste after their use and they pollute the atmosphere. To protect the environment as well as to take advantage of plastic, recycling procedure is used. Plastic recycling is the process of reprocessing used scrap and waste plastic into new plastic material. Recycling old plastic products uses 20%-40% less energy than manufacturing it from new.

To aid the recycling process, plastics come with plastic identification code to identify the different polymers that are used in the manufacture of plastic. The American Society of Plastics has recognized seven different types of plastic and has given each category a number, which can be found on the bottom of the plastic container.

Plastics find application in a wide range of products, in industrial and agricultural applications and consumer use. Hence, the demand for plastics depends largely on growth in user segments and overall macro-economic growth. It has been seen that the consumption of polymers is closely linked to the economic development of a country. In this respect, plastics are similar to rubber and driven by the same factors. Thus all used plastics will either go for recycling or land filling. If all plastics could have been recycled, we could reduce our oil consumption and save 25% of our landfill space.

Plastics waste recycling is considered to be one of the most viable projects all over the world today. Developed countries like Japan, Korea, reprocess plastic waste in a big way. There are new techniques introduced every day; however, the polymer industry can develop new grades and types of plastics, that too faster than the recycling equipment industry can develop identification & sorting techniques as well as equipment.

There is still much that can be done to improve the collection and infrastructure of the recycling industry. Incentives to increase collection and use of recycled or bio based materials come mainly from legislatively mandated initiatives or from positive business climates (such as dramatic increases in oil prices or consumers demand).

There is a very good scope and market potential for recycling. New entrepreneurs should venture into this field.

***Cost Estimation:***

Capacity	: 720000 Kg/Annum
Plant & Machinery	: 65 Lakhs
Total Capital Investment	: 192 Lakhs
Rate of Return	: 42%
Break Even Point	: 46%

**Chip Block (Compressed Wood)**

Wood waste is, by far, the largest portion of the waste stream generated from woodworking industry. Almost everyone in the woodworking business has a problem with wood scrap, chips and sawdust occurring as a by-product of woodworking. From the mill to the finished product, this offal represents an impressive amount, approximately 50 percent and is usually categorized as "waste." Piles of wood waste can be quickly turned into piles of savings and profits with the proper wood waste disposal system. Wood waste generated at residential and commercial wood frame construction sites offers a greater potential for reuse due to the ease of separating the wood during the various stages of construction. Cut-offs and scraps generated during the framing and trimming stages constitute a relatively clean and homogeneous waste stream that can make an excellent feedstock for engineered wood production. This type of wood waste represents a highly desirable form of wood waste that processors are eager to obtain. Hence all these alternatives can save money in avoided disposal fees and potentially generate income from the sale of salvageable materials.

Shavings and sawdust may be reground into wood flours, or the wood flour may be recovered as sized "dust" materials that have been screened and separated. Wood flour has major industrial markets in industrial fillers, binders and extenders in industrial products like epoxy resins, fertilizers, adhesives, absorbent materials, felt roofing, inert explosive components, ceramics, floor tiles, cleaning products, wood fillers, caulks and putties, soil extenders and a vast array of plastics. Some wood flours like mesquite may be used in edible flavourings for human or pet consumption. Wood/sawdust chip block are generally used as packing components. They are also used as the feet of wooden pallet in packaging.

Wood-fire systems using sawdust, shavings or shop-produced wood waste, accounts for 88 percent of power production, with landfill gas accounting for 8 percent, agricultural waste 3 percent and anaerobic digesters 1 percent of power production. Some power companies co-fire biomass with coal to save fuel costs and earn emissions credits. Using wood waste or other biomass in the fuel mix enhances their competitiveness in the market place. Added to decreased production and less supply to meet what had been the demand, there has been increasing demand for sawdust from the bio-energy sector as more consumers are incorporating pellet stoves and pellet-fueled hot-water boilers into their homes. This has led to increasing numbers of wood-pellet producers, especially in the northern and northeastern states. The increased demand for sawdust and increased price for the commodity has primarily impacted livestock producers, particularly dairy farmers and hog producers who use sawdust as part of a composting system for decomposing quarantined carcasses.

There is a very good demand and market potential for this product.

***Cost Estimation:***

Capacity	:	180000 Nos./Annum
Plant & Machinery	:	70 Lakhs
Total Capital Investment	:	136 Lakhs
Rate of Return	:	42%
Break Even Point	:	45%

**Municipal Waste Treatment**

Municipal wastes are wet solid waste which comes out from the domestic waste, marketing area waste, slaughter's house waste, dead animal waste, paper and packaging waste, mixed together as well as it is mixed with masonry waste. Municipal waste is basically treated by tunnel reactor. Basically this is waste treatment process. Now a day's modern world is full of load of pollution. To reduce the pollution it is necessary to treat the waste material to form wealth. It is needless to say for the benefit of human beings, it is necessary to treat the municipal waste to produce end products which have commercial value as well as to clean the environment. Demand for such municipal waste treatment processes is bound to go up. You can invest in this project.

***Cost Estimation***

Plant Capacity	:	24 Tons/Day
Plant & M/c	:	Rs. 74.3 Lakhs
W. C. for 3 Months	:	Rs. 20.0 Lakhs
Total Capital Investment	:	Rs. 118.2 Lakhs
Rate of Return	:	32.02%
Break Even Point	:	62.83%



### **Bio-Coal Briquettes from Agricultural Cellulosic Waste**

Energy is the key factor in economic development of country. As we approach the turn of century our requirements of energy will increase rapidly and vastly. Though there are several alternative conventional as well as non-conventional energy sources have been developed, still world is facing energy crisis day by day and it will rise in the coming future with rapid increase in population as well as industrialization. India is one of the big countries in the world having vast energy resources but these are not properly exploited to achieve maximum benefit and to check energy crisis. At present our country is fulfilling its demand by importing the crude petroleum oil from gulf countries. It has been expected that approximately 450 million tons of coal, 80 million tons of crude oil and 150 million tons of firewood will be required at that time to meet the domestic demand in our country.

Among the non-conventional forms of energy, Bio-Energy offers vast potential under Indian conditions, due to the wide spectrum of biomass available in different agro-climatic regions of the country. It is estimated that over 120 million tons of agricultural and forest residues are generated annually. The biomass includes agro-industrial bi-products and animal refuse. These constitute tremendous waste problems in spite of their known high energy potential. Currently both storage and disposal only add to costs and hence affects productivity and profitability. At present most of these are not collected at all, or are burnt to reduce fire hazards or used inefficiently.

Handling and transportation of these materials is difficult due to their low bulk densities and irregular sizes. These wastes, after processing can be converted into high density, high value solid fuel briquettes, known as "BIOCOAL" which can be efficiently used to replace coal and fire wood. Briquettes solid fuel known as biocoal can be used by the industrial, commercial and household domestic sectors.

It has been found that several alternative energy sources has come up, among them, utilization of agricultural residues, forest residues, municipal garbage into valuable solid fuel is one which is one of the modern and latest concept which has come up to meet the growing demand of fuel. It is a cheaper solid fuel with high calorific and heating value. Its demand will definitely rise with rapid industrialization in the coming future.

So a new entrepreneur can well venture into this field by fully assessing the fuel requirement by different small, medium and large-scale industries. The new prospective and decisive entrepreneurs can well venture by installing a unit of biocoal manufacturing to satisfy present and future demand.

#### ***Cost Estimation:***

Capacity	: 4800 MT/Annum
Plant & Machinery	: 28 Lakhs
Total Capital Investment	: 129 Lakhs
Rate of Return	: 46%
Break Even Point	: 38%

## Chapter 66

### WIRE AND RELATED PRODUCTS

#### Rosin Cored Soft Soldering Wire

Soldering is a process of joining solid components by introduction between them a molten alloy (solder) having a lower melting point than that of the base metal components being joined. Apart from electrical & electronics, soldering is applied in plumbing, manufacture of radiators, sealing of tin cans etc. Not only tin and lead are used to manufacture of solder, but depending upon the application other constituents are also used. Since the bulk consumer is the electrical and electronic industries, the development in these industries ensures the growth in demand of the solder. This is a very small scale industry.

#### *Cost Estimation*

Plant Capacity	:	500 Kg Soldering Wire/Day
Plant & Machinery	:	Rs. 38.40 Lacs
Fixed Capital	:	Rs. 86.65 Lacs
Working Capital/Month	:	Rs. 35.70 Lacs
Total Capital Investment	:	Rs. 193.76 Lacs
Annual Turnover	:	Rs. 420 Lacs

#### R-F Coaxial Cable

A Coaxial Cable is one that consists of two conductors that share a common axis. The inner conductor is typically a straight wire, either solid or stranded and the outer conductor is typically a shield that might be braided or a foil. Coaxial cables and systems connected to them are not ideal. There is always some signal radiating from coaxial cable. Hence, the outer conductor also functions as a shield to reduce coupling of the signal into adjacent wiring. More shield coverage means less radiations of energy (but it does not necessarily mean less signal attenuation). Most common coaxial cable impedances is used in various applications are 50 ohms 75 ohms 50 ohms cable is used in radio transmitter antenna connections, many measurement devices and in data communications (Ethernet). 75 ohms coaxial cable is used to carry video signals, T.V. antenna signals and digital audio signals. For maximum power handling, somewhere between 30 and 44 ohms is the optimum. Impedance somewhere around 77 ohms gives the lowest loss in

a dielectric filled line 93 ohms cable gives low capacitance per foot. It is practically very hard to find any coaxial cables with impedance much higher than that with the unleashing of the liberalisation policy and the opening up of the power sector for private participation, the cable industry undertook bold programmer of expansion. However, new projects were delayed due to policy constrains of diverse nature. This industry can be very profitable for entrepreneurs.

*Cost Estimations:*

Plant Capacity	: 20000 Meters/Day
Plant & M/c	: 1 Crore
W.C. for 3Months	: 1.70 Crore
Total Capital Investment	: 3.45 Crore
Rate of Return	: 43%
Break Even Point	: 38%

**PVC Electric Wires & Cables**

In the field of insulated cables, PVC cables have occupied an important place and in fact these are most popularly used in homes for domestic wiring. Various types of PVC cables are available, e.g., cables for control, signaling, instrumentation, rural electrification and house wiring, communication as well as for use in wires, automobiles, T.V. electric welding etc. These cables are suitable where the wire-temperature during use does not exceed 70°C. They are usually of two grades viz., 250/440 volts grade cable and 640/1100 volts grade cable.

Some of the types of PVC cables are

- (1) PVC insulated entwined wires used for service connections
- (2) Twin twisted PVC insulated wire for appliances
- (3) Flat type PVC cord having two parallel PVC insulated wires for appliances
- (4) Round type PVC cord having twin twisted PVC coated wire sheathed with round PVC sheathing
- (5) PVC insulated over head wire consisting of 20 to 30 core wires about 0.5 mm. dia., twisted together and covered with PVC
- (6) PVC insulated control cable for appliances, low voltage distribution, telephone wire, switch board wiring, and cables for automobiles.

Owing to their uses these cables are categorized as:

- (1) Domestic cables & wires
- (2) Power cables.

PVC wires & cables are used in home appliance, house wiring, T.V, VCR control panel, power distribution & secondary transmissions etc. The main use of PVC wires & cables are in house wiring. Since as the name suggests it's used everywhere, where electricity is to be carried from one point to another with safety.

Wires and cables sector basically consists of two areas: (i) power; and (ii) telecommunication. Power cables are PVC or PE clad, while the cables for telecommunication sector are based on PE (Polyethylene). The power cable industry can be divided into two segments - those manufacturing high voltage and specialty cables and those manufacturing low voltage wires and domestic cables.

In India, power cables mostly use aluminium on grounds of economy, although copper is a better conductor. In terms of costs, copper accounts for 15-20%, of while aluminium accounts for 15-30%. PVC accounts for another 5-6% of the total cost.

The Indian power cable industry has about a dozen producers in the organized sector, claiming more than two-thirds share of the market. The unorganized sector is constituted of a few small units. The divergence in the two segments goes beyond their unit sizes. The two sectors exhibit significant differences in quality and the capacities. While the organized sector has been manufacturing high voltage and specialty cables, the unorganized sector limits itself to the relatively low voltage market. The organized segment caters also to the industrial market.

So there is an ample space and good scope for new entrepreneurs to venture into this field.

#### ***Cost Estimation:***

Capacity	:	3000000 Mtrs/Annum
Plant and Machinery	:	36 Lakhs
Total Capital Investment	:	151 Lakhs
Rate of Return	:	48%
Break Even Point	:	38%

#### **Stitching Wire**

Stitch wire used for stitching cardboard carton/boxes in stitching paper notebooks, books, paper boxes etc. This is a product, which enjoys a large demand in industrial areas. Stitch wire is produced from standard wire rod of mild steel drawing to thin gadgets of wires of circular cross section followed by flattening. It comes in the shape of coil, with a bundle weighing from 80 to 300 kgs.

Stitch wire is used in all such industries where stitching work is required. It is used in press to stitch the books, cardboard boxes, corrugated Boxes

etc. it is used in paper box making industries to stitch the paperboard. It is also used to make the staples, which are used to staple the loose papers in all offices.

There are many large scale and small-scale units manufacturing the stitch wire. But only few of them are producing the proper quality stitch wire for stitching purposes. Some wires are hard & brittle which break during stitching while some of them are so soft that they are not capable to bind the papers tightly. The flat low carbon steel wire is an essential raw material for corrugated board & boxes industry, paper boxes etc. These boxes are light and inexpensive. The market for such boxes is ever increasing for packaging of fragile and other industrial products. The demands for paper box stitching wires are directly related to the growth of board and boxes industry. The Federation of Corrugated Box Manufacturers (FCBM) of India is concentrating in identification of new areas of demand. According to the FCBM report, the craft paper consumption in this industry is increasing rapidly.

Engineering, Electronics, Horticulture, Defence, Textiles, processed foods, Soaps and detergents, Cosmetics, Handicrafts, chemicals, insecticides, Glass, plastic/rubber goods, Agarbatti, cigarettes, Home appliances, leather goods, moulded luggage and various other industries are increasingly using the corrugated board boxes for safe & light packing. The over all picture of demand & supply indicates that the existing market can be greatly enlarged. Looking at the accelerating demand prospects, the capacities of card board boxes industries are being improved rapidly, and new & highly productive machines are being developed & installed. Moreover, the wire drawing unit in India has grown to a very good level. All types of drawn wires are readily available indigenously to cater to this industry with the major raw materials of specified quality. The flat stitching wire industry can take the advantage of this imminent bright scope in future. New entrepreneur should venture into this field.

***Cost Estimation:***

Capacity	: 15000 MT/Annum
Plant & Machinery	: 8 Lakhs
Total Capital Investment	: 215 Lakhs
Rate of Return	: 48%
Break Even Point	: 31%



### Wooden Toothpicks

A toothpick is a small stick of wood, plastic, bamboo, metal, bone or other substance used to remove detritus from the teeth, usually after a meal. A toothpick usually has two sharp ends to insert between teeth. They can also be used for picking up small appetizers or as a cocktail stick. There is a large and growing market for toothpicks in domestic as well as globally for example in Nigeria and neighbouring African countries. Virtually everybody use toothpicks daily to remove unwanted leftover food stuck to the teeth. Market for this product is readily available and can be sold locally or exported to earn foreign exchange because of its high export potentiality.

There is a good scope for new entrepreneurs to start a toothpicks manufacturing unit.

#### *Cost Estimation:*

Capacity	:	150000000 Pcs./Annum Tooth Pick of Dia 2.0 to 2.2 mm Length 65 mm 1 Pkt = 1000 Pcs. of tooth pick (500 Pkt./Day)
Plant & Machinery	:	6 Lakhs
Total Capital Investment	:	22 Lakhs
Rate of Return	:	42%
Break Even Point	:	62%

### Wooden Furniture

Wooden furniture is used for articles of daily use in dwelling house, place of business, public buildings and includes items such as chairs, tables, beds, safes, sofa sets, almirahs, cabinets, etc. are made of wood. The furniture making is an ancient art in India before centuries, the expertise of India in manufacturing furniture was accepted by all the parts of the world. A good finishing and durability of wood furniture is depend on four factors i.e. types



of wood, seasoned wood, skill of carpenter, and machine operation. Also for super finishing and long life of wood furniture is depending on polishing material, and process of coating.

Wood furniture industry establishment include cottage units, and medium and large sized factories. Industry on wooden furniture is enjoys good market. Wooden furniture gives an impression of art and Indian culture. Also it gives a good margin from its by-products. In India the modern sector of small, large-scale manufacturer have played a significant role in the socio-economic development of the country. Blessed with immense stock of natural resources, forest is one of the important natural assets in India. The fast emerging concept of standard lifestyle, interior designing, sense of cleanliness, comfort and architecture has given furniture Industry an essential ever growing platform and thus empowering the industry to be termed as great manufacturers and exporters of grand quality furniture in terms of art, style, technology and beauty. And of course, globalization and media are also strong factors to give rise to the industry. The strongest factor for this upraise is the huge investment done by the foreign manufacturers and the credit definitely goes to versatile range of products by the industry.

The marked development of the industry has enhanced the leading foreign brands to budget in their confidence and money in Indian Furniture Industry. The world market now feels pleasure and confident to join hands with Indian Furniture brands, to name few are Godrej & Boyce Manufacturing Co. Ltd., Furniturewala, Zuari, Yantra, Renaissance, N R Jasani & Company, Furniture Concepts, Durian, Kian, Millennium Lifestyles, Truzo, PSL Modular Furniture, BP Ergo, Tangent, Featherlite and Haworth and much more to add to the growth of the industry. Accordingly per capita consumption of wooden furniture was calculated and then it has been appreciated by the estimated per capita consumption of wooden furniture for the future years as well as by the estimated increase in population. If good marketing organization is set up then with higher penetration in the market of other types of furniture, demand will increase to a higher level than anticipated here. There is a lot of potential in this sector.

***Cost Estimation:***

Capacity	:	7500 Pcs./Annum
Plant & Machinery	:	13 Lakhs
Total Capital Investment	:	118 Lakhs
Rate of Return	:	46%
Break Even Point	:	38%

**Wooden Laboratory Furniture**

The most common, versatile and oldest material that is used for making furniture is wood. Almost all varieties of furniture can be made of wood. Wood

is a soft material and can be easily shaped. The finish obtained is very good and occasional polishing can make it look like new at all times.

All laboratory furniture is designed to be both functional and attractive. The materials and components we use are all researched for their chemical resistance, heat & moisture resistance, durability and practicality. The all aspects of laboratory bench surface and additional furniture system types and finishes from general purpose installations to highly specialized requirements. The laboratory furniture includes laboratory casework, benches and fume hoods. Which includes, but is not limited to wood casework, metal casework, countertops, reagent shelves, fume hoods, tables, standards, slotted studs, casework in environmental rooms, utility space farming, utility space closure panels between base cabinets and at exposed ends of utility spaces, laboratory sinks, cup sinks, cup drains, strainers, overflows and sink outlets and miscellaneous items.

The Indian wooden furniture industry is generating approximately a turnover of Rs. 3500 crore annually. The market of wooden furniture solely owns the share of nearly Rs. 60 crore. And as per one of the survey done recently, the industry is expected to grow by 20% in coming times. Competition is keen in the furniture Industry. India offers a huge potential market for furniture maker. The wooden laboratory furniture have served different purposes in school, institutional offices, hospitals and residential. The rising population and trends in school, hospital, institutional offices etc have added a huge demand for innovative design of wooden laboratory furniture.

The demand of wooden laboratory furniture is increasing rapidly, so, there is wide scope for new entrepreneurs.

***Cost Estimation:***

Capacity	:	48000 Pcs./Annum (Wooden Laboratory Furniture) Cabinet, Racks & Benches 20 Pc Per Day. Tables 60 Pcs & Chair 40 Pcs. Per Day.
Plant & Machinery	:	42 Lakhs
Total Capital Investment	:	288 Lakhs
Rate of Return	:	46%
Break Even Point	:	41%

**Pre-Laminated Particle Board**

Pre-Laminated Particle Boards give a new look to both the surroundings and one's day to day life. Particle boards are very versatile and can be used for all types of interior applications. The particle board can be of plain and pre laminated variety. These boards are superior in terms of the physical strength

and flexibility in usage are extremely versatile and cost effective building material known for durability and superior finish. In India, both in house and foreign, i.e. European technologies are in use for the manufacturing of these boards. The pre laminated board range boasts of the largest range of decors in India.

Pre-laminated Particle Boards can be used for computer tables, T.V. trolley, shop furniture, office interiors, wall partitions, Indoor sports items. These board products are used in industries ranging from building and construction to Interiors, furniture and handicrafts. The uses for particle board are still developing, but the main ones parallel those for lumber core in veneered or overlaid construction and plywood. The two properties of particle board that have the greatest positive influence on its selection for a use are uniform surface and that the panel stays flat as manufactured, particularly in applications where edges are not fastened to a rigid framework.

This industry was established in Calcutta, Gujarat and Mumbai in the late in fifties to cater to the need of the textile and jute mills in respect of wooden accessories for its looms, such as picking sticks, side lever, shuttle pegs, race boards etc. this industry was mainly in the unorganized small scale industry sector.

The Indian market for particle board and plywood is estimated in value terms, at over Rs 17 bn. Of the total market, particle board accounts for over 30% of the market with the rest over 70% accounted by plywood segments. Western India has emerged as the leader in the particle board segment.

So, in future there is very good scope for pre laminated particle board.

***Cost Estimation:***

Capacity	: 15000 cu.mt./Annum
Plant & Machinery	: 137 Lakhs
Total Capital Investment	: 10 Crores
Rate of Return	: 45%
Break Even Point	: 32%